# Service Man

Vol.

Summary **Technical Descriptions**  Portable Video Cassette Recorder





#### SPECIFICATIONS

Power Source:

12 VDC

Battery LCS-2012P Elec. Tuner Unit PV-A200 Prog. Tuner Unit PV-A500 Multiple AC Adaptor PV-A100 Plug-in AC Adaptor PV-A110

Power Consumption: Television System:

Approx. 7W at Play mode

EIA Standard (525 lines, 60 fields)

NTSC color signal

Video Recording

System: 2 rotary heads helical scanning system

Luminance: FM azimuth recording Chrominance: Converted subcarrier

phase shift recording

Audio Track:

1 track

Tape Format:

Tape width 1/2" (12.7 mm), high density

tape

Tape Speed:

SP mode: 1-5/16 i.p.s (33.35 mm/s) LP mode: 21/32 i.p.s (16.67 mm/s) SLP mode: 7/16 i.p.s (11.12 mm/s) Record/Playback Time: 360 min. with NV-T120 used in SLP

mode FF/REW Time: Less than 6 min. with NV-T120 Heads: Video: 2 Rotary heads Audio/Control: 1 stationary head

Erase: 1 full track erase 1 audio track erase for audio

dubbing

Input Level:

Video: VIDEO IN Jack (RCA type)  $1.0\,\mathrm{Vp}$ -p,  $75\Omega$  unbalanced

Audio: MIC IN Jack

 $-70\,\mathrm{dB}$ ,  $600\Omega$  unbalanced

Output Level:

Video: VIDEO OUT Jack (RCA type)

 $1.0\,\mathrm{Vp}\text{-p},\,75\,\Omega$  unbalanced

Audio: AUDIO OUT Jack (RCA type)

 $-6\,\mathrm{dB}$ ,  $600\Omega$  unbalanced

RF Modulated: Ch3/Ch4 switchable. 72 dBμ (open voltage),

 $75\Omega$  unbalanced

Video Horizontal

Resolution: More than 230 lines

Audio Frequency

Response: SP: 100 Hz~8kHz, (10 dB down) LP: 100 Hz ~ 6 kHz.

SLP: 150 Hz~5kHz

Signal-to-Noise Ratio: Video: SP mode: better than 40dB

LP mode: better than 40 dB SLP mode: better than 40 dB (Rohde & Schwarz noise meter)

Audio: SP mode: better than 42dB LP mode: better than 40dB SLP mode: better than 40dB

Operating

Temperature:  $32^{\circ}F \sim 104^{\circ}F (0^{\circ}C \sim 40^{\circ}C)$ 

Operating Humidity: 10% ~ 75%

Weight:

8.4 lbs (3.8kg) (with internal battery pack) Dimensions:  $9-3/8 \text{ "(W)} \times 3-5/8 \text{ "(H)} \times 9-9/16 \text{ "(D)}$ 

 $238(W) \times 92.5(H) \times 242(D) mm$ 

Weight and dimensions shown are approximate. Specifications are subject to change without notice.

# anasonic

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# INTRODUCTION

This service manual contains information which will allow service technicians to understand and service the Panasonic compact and light weight portable VHS video recorder Models PV-5200 and PV-5500. These models consist basically of the PV-5000 Video Tape Recorder and various accessories to compliment the deck.

Some of the many special features include extended recording time of up to 6 hours, portability, soft touch function controls, SLP search, convenient 4 power source system (battery pack, the tuner unit, a car battery or the AC adaptor/Plug-in AC adaptor), minimal picture interference during add-on and insert recording, multimotion playback at your option, high speed battery charging, one touch recording with the tuner and a battery saving feature when the recorder is used with the great selection from the Panasonic Color Camera line.

In addition this deck features the simplified and reliable new tape loading method, a directly driven head cylinder and capstan servo motor, a one touch connection method to the tuner or AC adaptor and it is light weight and very compact.

These features in addition to the basic VHS format make the PV-5200/PV-5500 an ideal unit for your education, recreation and entertainment.

Just slightly ahead of our time.....PANASONIC

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# SYSTEM FEATURES

# 1. Compact and light weight

This truly compact and lightweight Video Cassette Recorder is the result of such developments as simplified construction, the reduction in size of various mechanical parts, and the use of ICs (integrated circuitry).

# 2. Six hour recording

New system for high-density recording allows up to 6 hours of recording on a single NV-T120 tape.

## 3. One touch connection

The Recorder can be connected to the Tuner, AC Adaptor or Car Battery Cord. (Use the adaptor-connection cord only.)

# 4. Multi-motion playback

In addition to playback at normal speed, you can operate multi-motion playback as follows. (For tapes recorded in SLP speed.)

SEARCH	forward and reverse at about 9 times normal speed
STILL-FRAME	to view a single scene
FINE-SLOW	for noiseless slow-motion
FRAME ADVANCE	to watch frame-by-frame playback

# 5. Fine-editing function

The Recorder eliminates the editing problem common to ordinary VCRs. When the pause is used during recording, the tape will automatically rewind slightly to reduce this break to a minimum of interference.

#### 6. INSERT

The Recorder enables you to substitute your desired picture for a previously recorded tape at any segment.

# 7. Four way power

The Recorder can be operated with a Battery Pack, the Tuner unit, a car battery or the AC Adaptor/Plug-In AC Adaptor.

# 8. High speed charging

The AC Adaptor can charge for about 1.5 hour, and the Tuner can charge within 3 hours.

# 9. Watch one channel while recording another

The built-in tuner allows the recording of a program that you don't want to miss while watching another program.

# 10. Unattended recording

The Programmable Tuner/Timer enables you to preset the Portable Video Cassette Recorder to record a TV program while you are away for the day (with model PV-A200) or to record up to 4 programs within a period of 14 days (with model PV-A500).

# 11. One touch recording

The Tuner enables you to do impromptu timer recordings at any time. Just select the channel and push the One Touch Record Button for 30 minutes to 2 hours of recording.

#### 12. Remote control

The 12 functions Wired Remote Control (supplied with PV-5000, PV-5200) provides:

REC, PLAY, STOP, FAST-FORWARD, REWIND, PAUSE/STILL, SEARCH <Forward, Reverse>, FRAME ADV, FINE-SLOW, SLOW SPEED <Up, Down>.

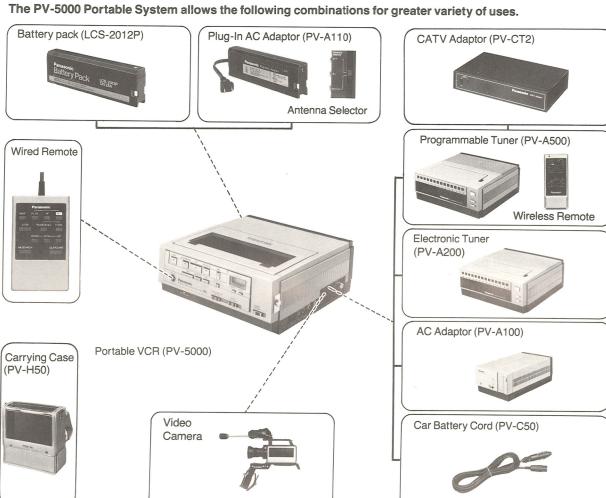
The 16 functions Wireless Remote Control (supplied with PV-5500, PV-A500) provides:

POWER, REC, PLAY, CHANNEL <Up, Down>, STOP, VCR/TV, FAST-FORWARD, REWIND, PAUSE/STILL, SEARCH <Forward, Reverse>, FRAME ADV, FINE-SLOW, SLOW SPEED <Up, Down>.

# 13. CABLE-READY

When used in cable systems, the extended range tuner allows reception of standard Mid-Band (Channels A–I) and Super-Band (Channels J–W) TV programs (with model PV-A500). However, reception of intentionally scrambled programs may require special equipment from your cable company.

# **PV-5000 PORTABLE SYSTEM**



PV-5000 PORTABLE SYSTEM AND ACCESSORIES YOU CAN PURCHASE FO	OR '	YOUR MODE	L

TOTAL										
COMPONENTS	VCR	Wired Remote Control	PV-A500	PV-CT2	PV-A200	PV-A100	PV-A110	PV-C50	PV-H50	LCS-2012P
PV-5500	Included	Not Separately Available	Included	Optional	Optional	Optional	Optional	Optional	Optional	Included
PV-5200	Included	Included	Optional	Not Applicable	Included	Optional	Optional	Optional	Optional	Included
PV-5110	Included	Included	Optional	Not Applicable	Optional	Optional	Included	Optional	Optional	Included
PV-5000	Included	Included	Optional	Not Applicable	Optional	Optional	Optional	Optional	Optional	Included
Components Available	As Optional A	ccessories	Optional	Optional	Optional	Optional	Optional	Optional	Optional	Optional

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

**WARNING:** ONE FEDERAL COURT HAS RULED TAHT IN-HOME RECORDING OF COPYRIGHTED TELEVISION PROGRAMS IS COPYRIGHT IN-FRINGEMENT. PURCHASERS SHOULD NOT RE-**CORD SUCH PROGRAMS.** 

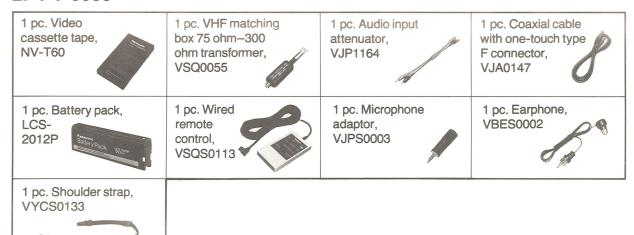
CAUTION: TO PREVENT FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

# **ACCESSARIES SUPPLIED**

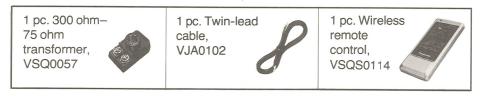
# 1. PV-5200 & PV-5500



# 2. PV-5000



# 3. PV-A500



# 4. PV-A200

1 pc. 300 ohm— 75 ohm transformer, VSQ0057



1 pc. Twin-lead cable, VJA0102



# 5. PV-A100

1 pc. 300 ohm— 75 ohm transformer, VSQ0057



# **OTHER OPTIONAL ACCESSORIES**

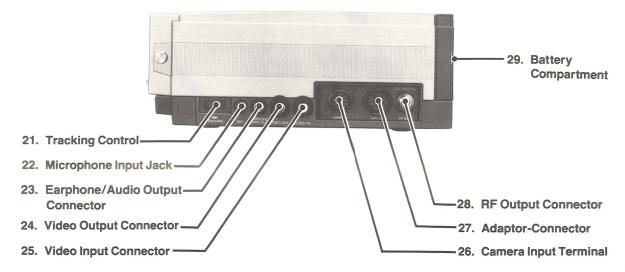
●1/2" video cassette tape: NV-T120 Approx. 810 ft. (247 m), 120, 240 or 360 min. NV-T60 Approx. 417 ft. (127 m), 60, 120 or 180 min.

System carrying case: PV-H55

# **CONTROLS AND COMPONENTS/PV-5000**

#### TOP and FRONT 20. Rewind/Search - Button 1. Cassette Holder 19. Play Button 2. Battery Eject 18. Fast Forward/Search → Button Button 17. RF Converter **Channel Selector** 3. Eject Button 16. Record Button **Tape Counter Battery Indicator Dew Indicator** 4. Stop Button **Memory Indicator** 14. Memory Switch 13. Reset Button 12. Power Switch 5. Remote Control Jack 11. Tape Speed Selector 6. Pause/Still Button **Audio Dub Button** 10. Camera Remote 7. Slow Tracking 8. Slow Button Switch

#### **SIDE VIEW**



#### 1. Cassette Holder

#### 2. Battery Eject Button

To remove the Battery, press this button.

#### 3. Eject Button

Press this button to insert or to remove cassette. It is not possible to eject the cassette while the tape is moving.

## 4. Stop Button

Press this button to stop the tape.

#### 5. Remote Control Jack

For connecting the Wired Remote Control unit.

#### 6. Pause/Still Button

Press this button to temporarily stop the tape movement in either the recording or playback mode. During SLP playback, a still-frame picture is produced when the pause is in use. Press again to release pause.

#### 7. Slow Tracking

Tracking control for use with slow-motion.

#### 8. Slow Button

Press this button for slow-motion playback of tapes recorded in SLP speed.

#### 9. Audio Dub Button

When this button is pressed simultaneously with the Play Button during playback, sound from another source can be recorded on the tape in place of the original sound. (The original sound will be erased.)

#### 10. Camera Remote Switch

When camera recording, this switch must be set to ON. Set it to OFF at other times.

#### 11. Tape Speed Selector (SP/LP/SLP)

Set this selector depending upon the length of the program.

#### 12. Power Switch

This switch is used to turn the VCR deck on and off.

#### 13. Reset Button

Pressing this button causes the Tape Counter to return to "0000".

#### 14. Memory Switch

When this switch is in the "ON" position, the tape will stop when the Tape Counter reaches "0000".

#### 15. <sub>┌</sub>Tape Counter

By beginning the recording at "0000" subsequent playback will be more convenient.

#### **Battery Indicator**

This indicates the remaining battery charge.

#### Dew Indicator

If condensation occurs in the VCR, the Dew Indicator will flash on and off for 3 seconds when the VCR is turned on and the VCR will be turned off automatically. In this case, wait until the lamp no longer flashes when the Power Switch is turned on again.

#### -Memory Indicator

"M" is indicated when the Memory Switch is ON.

# 16. Record Button

Recording is started by pressing this button and the Play Button at the same time.

#### 17. RF Converter Channel Selector

Set to channel 3 or 4, whichever is not used in your area

#### 18. Fast Forward/Search ▶▶ Button

Press this button to move the tape forward rapidly. During the play mode pressing this button will allow you to view the tape in the forward direction at about 9 times the recorded tape speed (recorded at SLP speed).

#### 19. Play Button

Press this button to play back recorded tapes.

# 20. Rewind/Search ■ Button

Press this button to rewind tapes. During the play mode pressing this button will allow you to view the tape in reverse at about 9 times the recorded tape speed (recorded at SLP speed).

#### 21. Tracking Control

Use this control during playback if the image is partially obscured by bands of noise.

# 22. Microphone Input Jack

For connecting a MIC Adaptor or Audio Input (Attenuator (included). This is useful for recording and audio dubbing.

## 23. Earphone/Audio Output Connector

For connection to a monitor TV, another VCR, audio tape recorder or earphone.

#### 24. Video Output Connector

For connection to a monitor TV or another VCR.

#### 25. Video Input Connector

For connection from another VCR.

#### 26. Camera Input Terminal

For connection of a portable video camera (optional).

# 27. Adaptor-Connector

This can be used to connect the Recorder to the Tuner, the AC Adaptor or the Car Battery Cord with a single connection.

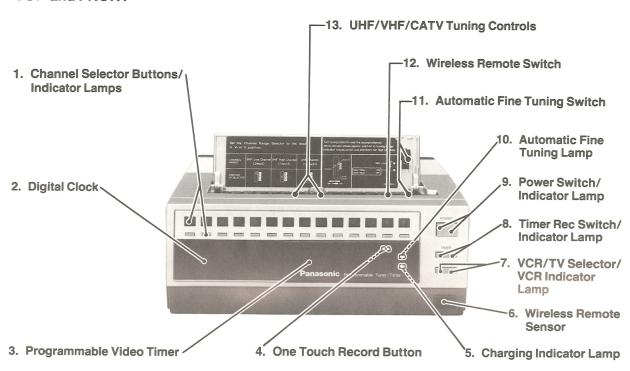
#### 28. RF Output Connector

For connection to a TV. This connector is the signal output connector from the RF Convertor (Channel 3 or 4).

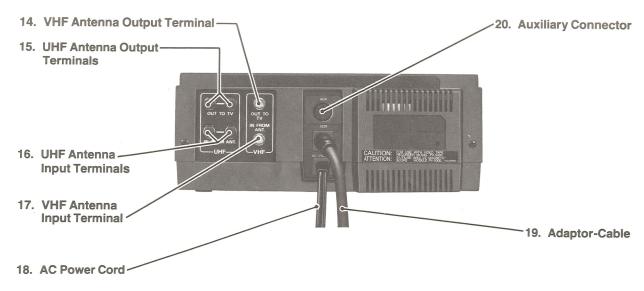
# 29. Battery Compartment

# **CONTROLS AND COMPONENTS/PV-A500**

# **TOP and FRONT**



#### **BACK**



# 1. Channel Selector Buttons/Indicator Lamps

Select the channels (2–83, A–W) you wish to view or record by pressing any one of these 14 buttons.

#### 2. Digital Clock

#### 3. Programmable Video Timer

Use this timer to make an unattended recording when you are away from home, busy or asleep.

#### 4. One Touch Record (O.T.R.) Button

One Touch Recording enables you to do impromptu recordings at any time. Just select the channel and push the One Touch Record Button for 30 minutes to 2 hours of recording.

# 5. Charging Indicator Lamp

Lights up when battery is being charged. When the charging has been completed, this lamp will go off.

#### 6. Wireless Remote Sensor

Receives signal from Wireless Remote Control.

#### 7. VCR/TV Selector/VCR Indicator Lamp

different program.

VCR: Push this button once to monitor video recording or to view playback.

TV: Push this button again to watch TV, or to view another program while recording a

The Lamp lights up when the VCR/TV Selector is in the VCR position.

#### 8. Timer Rec Switch/Indicator Lamp

This switch is used for unattended recording after programming functions have been completed. When this switch is ON, the Indicator Lamp lights up and you will not be able to operate the unit manually.

# 9. Power Switch/Indicator Lamp

This switch is used to turn the Tuner unit power ON and OFF.

# 10. Automatic Fine Tuning (AFT) Lamp

The Lamp lights up to indicate that the Automatic Fine Tuning is activated.

#### 11. Automatic Fine Tuning (AFT) Switch

Under normal conditions turn the AFT switch "ON". When the Tuning Control Panel door is opened the AFT circuit is defeated (AFT Lamp turns OFF). Turn the AFT "ON" or close the Tuning Control Panel door (AFT Lamp turns "ON") to activate the AFT.

#### 12. Wireless Remote Switch

This switch determines whether the Wireless Remote Control can be received or not.

## 13. UHF/VHF/CATV Tuning Controls

There are fourteen positions available (fourteen buttons) and each one can be tuned to any channel you desire.

#### 14. VHF Antenna Output Terminal (To TV Set)

Connect this terminal to the VHF antenna terminal on the TV.

#### 15. UHF Antenna Output Terminals (To TV Set)

Connect these terminals to the UHF antenna terminals on the TV.

# 16. UHF Antenna Input Terminals (From Antenna)

Connect the UHF antenna to these terminals.

# 17. VHF Antenna Input Terminal (From Antenna or CABLE)

Connect the VHF antenna or CABLE to this terminal.

#### 18. AC Power Cord

Connect to a 120 V AC outlet.

#### 19. Adaptor-Cable

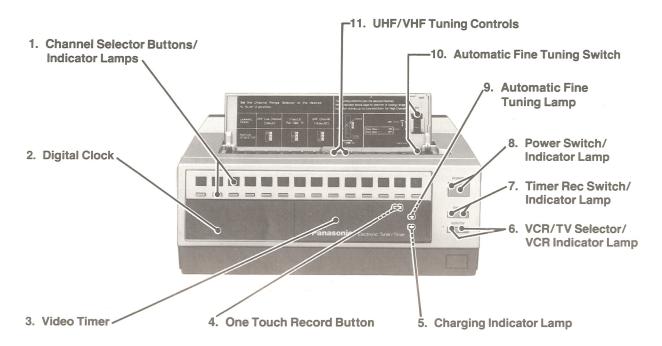
Connect to the Adaptor-Connector of the Recorder.

#### 20. Auxiliary Connector

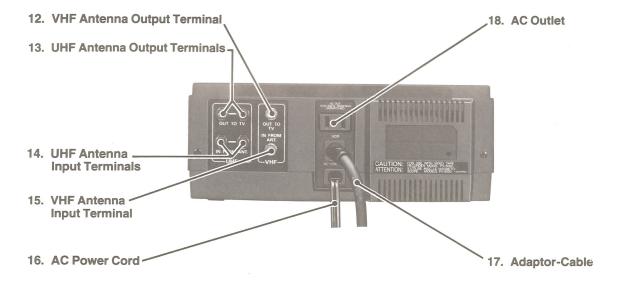
Connect the VCR Remote Control Cord of the CATV Adaptor/PV-CT2 (optional) to this connector. Using the CATV Adaptor and the Cable Descrambler Box, all functions (e.g. Timer Recording, Recording one channel while watching another) are operable even for both regular TV channels and one pay TV channel. Refer to the Operating Instructions of the PV-CT2.

# **CONTROLS AND COMPONENTS/PV-A200**

## **TOP and FRONT**



# **BACK**



# 1. Channel Selector Buttons/Indicator Lamps Select the channels (2–83) you wish to view or record by pressing any one of these 14 buttons.

# 2. Digital Clock

#### 3. Video Timer

Use this timer to make an unattended recording when you are away from home, busy or asleep.

#### 4. One Touch Record (O.T.R.) Button

One Touch Recording enables you to do impromptu recordings at any time. Just select the channel and push the One Touch Record Button for 30 minutes to 2 hours of recording.

#### 5. Charging Indicator Lamp

Lights up when battery is being charged. When the charging has been completed, this lamp will go off.

# 6. VCR/TV Selector/VCR Indicator Lamp

VCR: Set to 'button in' position to monitor video recording or to view playback.

TV: Set to 'button out' position to watch TV, or to view one program while recording a different program.

The Lamp lights up when the VCR/TV Selector is set in the VCR position.

# 7. Timer Rec Switch/Indicator Lamp

This switch is used for unattended recording after programming functions have been completed. When this switch is ON, the Indicator Lamp lights up and you will not be able to operate the unit manually.

#### 8. Power Switch/Indicator Lamp

This switch is used to turn the Tuner unit power ON and OFF.

# 9. Automatic Fine Tuning (AFT) Lamp

Lights up to indicate that Automatic Fine Tuning is activated.

#### 10. Automatic Fine Tuning (AFT) Switch

Under normal conditions turn the AFT switch "ON". When the Tuning Control Panel door is opened the AFT circuit is defeated (AFT Lamp turns OFF). Turn the AFT "ON" or close the Tuning Control Panel door (AFT Lamp turns "ON") to activate the AFT.

# 11. UHF/VHF Tuning Controls

There are fourteen positions available (fourteen buttons) and each one can be tuned to any UHF/VHF channel you desire.

#### 12. VHF Antenna Output Terminal (To TV Set)

Connect this terminal to the VHF antenna terminal on the TV.

#### 13. UHF Antenna Output Terminals (To TV Set)

Connect these terminals to the UHF antenna terminals on the TV.

# 14. UHF Antenna Input Terminals (From Antenna)

Connect the UHF antenna to these terminals.

# 15. VHF Antenna Input Terminal (From Antenna)

Connect the VHF antenna to this terminal.

#### 16. AC Power Cord

Connect to a 120 V AC outlet.

#### 17. Adaptor-Cable

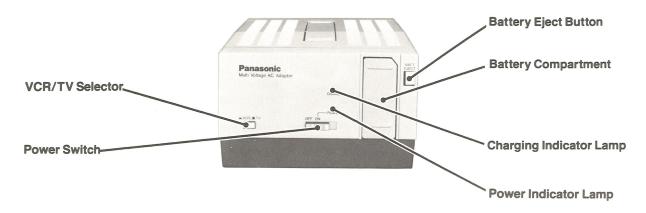
Connect to the Adaptor-Connector of the Recorder.

#### 18. AC Outlet

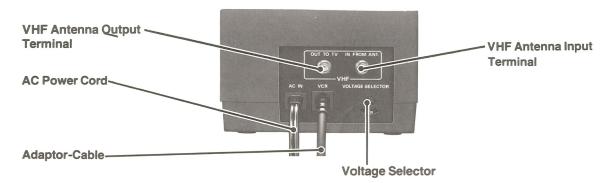
Convenience outlet for another appliance, such as a television etc., 120 V AC and not more than 300 watts

# CONTROLS AND COMPONENTS/PV-A100, PV-A110

# **TOP and FRONT of PV-A100 (AC ADAPTOR)**



#### **BACK**



**CAUTION:** The Selector has been set at the factory to 120 V AC (standard in the U.S.A. and Canada). If you will be using this Adaptor in a country with different voltage (100 V, 220 V, 240 V), you must adjust the Voltage Selector. To adjust, unplug this Adaptor from the wall outlet, using a small screwdriver, turn the Voltage Selector until the appropriate voltage number appears in the window.

SETTING THE VOLTAGE SELECTOR					)R
	LOCAL VOLTAGE	AC 100 V	AC 120 V	AC 220 V	AC 240 V

**CAUTION:** Operation at a voltage setting 100/220/240 V AC may require the use of a different AC plug. Please contact either a local or foreign electrical parts distributor for assistance in selecting an alternate AC plug.

# **PV-A110 (PLUG-IN AC ADAPTOR)**



# VHS-PRINCIPLE OF OPERATION

Basic Video Tape Recording

To understand the VHS format, it is wise to first review the basic principles of video tape recording.

Like audio tape recording, video information is stored on magnetic tape by means of a small electromagnet, or head. The two poles of the head are brought very close together but they do not touch. This creates magnetic flux to extend across the separation (gap), as shown: Fig. 1.

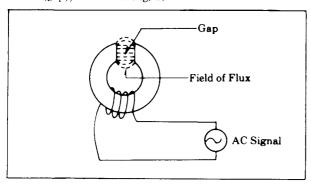


Fig. 1.

If an AC signal is applied to the coil of the head, the field of flux will expand and collapse according to the rise and fall of the AC signal.

When the AC signal reverses polarity, the field of flux will be oriented in the opposite direction and will also expand and collapse.

This changing field of flux is what accomplishes the magnetic recording. If this flux is brought near a magnetic material, it will become magnetized according to the intensity and orientation of the field of flux. The magnetic material used is oxide coated (magnetic) tape.

Using audio tape recording as an example, if the tape is not moved across the head, just one spot on the tape will be magnetized and will be continually re-magnetized. If the tape is moved across the tape, specific areas of the tape will be magnetized according to the field of flux at any specific moment. A length of recorded tape will therefore have on it areas of magnetization representing the direction and intensity of the field of flux. For instance:

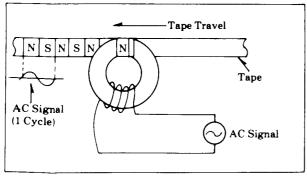


Fig. 2.

The tape will have differently magnetized regions, which can be called North (N) and South (S), according to the AC signal. When the polarity of the AC signal changes, so does the direction of magnetization on the tape, as shown by one cycle on the AC signal (see Fig. 2). If the recorded tape is then moved past a head whose coil is connected to an amplifier, the regions of magnetization on the tape will set up flux across the head gap which will in turn induce a voltage in the coil to be amplified. The output of the amplifier, then is the same as the original AC signal. This is essentially what is done in audio recording, with other methods for improvement like bias and equalization.

There are some inherent limitations in the tape recording process which do effect video tape recording, so they will be examined now.

As shown in Fig. 2, the tape has North and South magnetic fields which change according to the polarity of the AC signal. What if the frequency of the AC signal were to greatly increase?

If the speed of the tape past the head (head to tape speed) is kept the same, the changing polarity of the high frequency AC signal would not be faithfully recorded on the tape, as shown in Fig. 3.

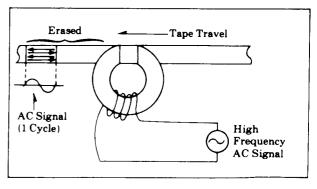


Fig. 3.

As the high frequency AC signal starts to go positive, the tape will start to be magnetized in one direction. But the AC signal will very quickly change its polarity, and this will be recorded on much of THE SAME PORTION of the tape, so North magnetic regions will be covered by South magnetic regions and vice versa. This results in zero signal on the tape, or self-erasing. To keep the North and Sough regions separate, the head to tape speed must be increased. (See Fig. 3.)

When recording video, frequencies in excess of 4 MHz may be encountered. Through experience, it is found that the head to tape speed must be in the region of 10 meters per second in order to record video signals.

The figure of 10 meters per second was also influenced by the size of the head gap. Clearly, the lower the head to tape speed, the easier it is to control that speed. If changes in head gap size were not made, the necessary head to tape speed would have been considerably higher. How the gap size influences this can be explained by Fig. 4.

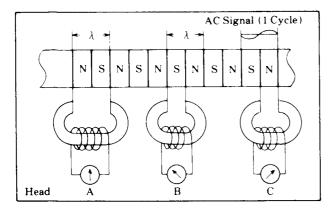


Fig. 4.

Assume a signal is already recorded on the tape. The distance on the tape required to record one full AC signal cycle is called the RECORDED WAVELENGTH or  $\lambda$ . Head A has a gap width equal to  $\lambda$ . Here, there is both North and South oriented magnetization across the gap.

This produces a net output of zero since North and South cancel. Head B and C have a maximum output because there is just one magnetic orientation across their gaps.

Maximum output occurs in heads B and C therefore, because their gap width is  $1/2\lambda$ . (Heads B and C would also work if their gap width is less than  $1/2\lambda$ .) The same is also true for recording. The maximum useable (no self-erasing) transfer of magnetic energy to the tape occurs when the gap width, G, can be expressed as.

$$G \leq \frac{\lambda}{2}$$

The RECORDING WAVELENGTH, can be expressed as:

 $\lambda = \frac{V}{f}$  where V is the head to tape speed and f is the frequencies to be recorded.

So,  $G \subseteq \frac{V}{2f}$ , as V increases, G is also allowed to increase for the same MAXIMUM frequency. Conversely if G is made very small, V is allowed to be reduced.

In practice, G can be made as small as (and smaller than)  $1\mu$  m (1 X  $10^{-6}$  meters) and this puts V in the area of 10 meters per second.

A head to tape speed of 10 meters per second is a very high speed, too high in fact to be handled accurately by a reel to reel tape machine of reasonable size. Also, tape consumption on a high speed reel to reel machine is tremendous.

The method employed in video recording is to move the video heads as well as the tape. If the heads are made to move fast, across the tape, the linear tape speed can be kept very low.

In 2-head helical video recording (the only format which will be discussed here) the video heads are mounted in a rotating drum or cylinder, and the tape is wrapped around the cylinder. This way, the heads can scan the tape as it moves. When a head scans the tape, it is said to have made a TRACK. This can be seen in Fig. 5.

In 2-head helical format, each head, as it scans across the tape will record one TV field, or 262.5 horizontal lines. Therefore, each head must scan the tape 30 times per second to give a field rate of 60 fields per second.

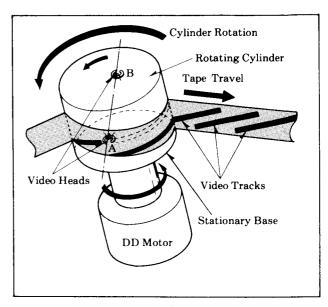


Fig. 5.

The tape is shown as a screen wrapped around the head cylinder to make it easy to see the video head. There is a second video head 180° from the head shown in front. Because the wraps around the cylinder in the shape of a helix (helica) the video tracks are made as a series of slanted lines. Of course, the tracks are invisible, but it is easier to visualize them as line. The two heads "A" and "B" make alternate scans of the tape.

An enlarged view of the Video tracks on the tape can be shown: Fig. 6

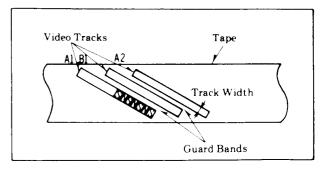


Fig. 6.

Refer to Fig. 6. The video tracks are the areas of the tape where video recording actually takes place. The guard bands are blank areas between tracks, preventing the adjacent track's crosstalk from appearing on the track where the video head is tracking.

There is one more point about video recording which will be discussed here. Magnetic heads have the characteristic of increased output level as the frequency increases. Then, as determined by the gap width, the maximum output occurs at

approximately 
$$G = \frac{V}{2f}$$

In practice, the lower frequency output of the heads is boosted in level to equal the level of the higher frequencies. This process, as also used in audio applications, is called equalization

Video frequencies span from DC to about 4 MHz. This represents a frequency range of about 18 octaves. 18 octaves is too far a spread to be handled in one system (one machine). For instance, heads designed for operation at a maximum frequency of 4 MHz will have very low output at low frequencies. Since there is 6 dB/octave attenuation, 18x6=108 dB difference appears. In practice this difference is too great to be adequately equalized. To get around this, the video signal is applied to an FM modulator during recording. This modulator will change its frequency according to the instantaneous level of the video signal.

The energy of the FM signal lies chiefly in the area from about 1 MHz to 8 MHz, just three octaves. Heads designed for use at 8 MHz can still be used at 1MHz, because the output signal can be equalized. Actually speaking, heads are designed for use up to about 5 MHz. Therefore, some FM energy is lacked but it does not affect the playback video signal, because it is resumed in the playback process.

Upon playback, the recovered FM signal must be equalized then demodulated to obtain the video signal.

# CONVERTED SUBCARRIER DIRECT RECORDING METHOD

The one method of color video recording that will be discussed here is the converted subcarrier method. In order to avoid visible beats in the picture caused by the interaction of the color (chrominance) and brightness (luminance) signals, the first step in the converted subcarrier method is to separate the chrominance and luminance portions of the video signal to be recorded. The luminance signal, containing frequencies from DC to about 4 MHz, is then FM recorded, as previously described. The chrominance portion, containing frequencies in the area of 3.58 MHz is down-converted in frequency in the area of 629 kHz. Since there is not a large shift from the center frequency of 629 kHz, this converted chrominance signal is able to be recorded directly on the tape. Also note that the frequencies in the area of 629 kHz are still high enough to allow equalized playback. In practice, the CONVERTED CHROMINANCE signal and the FM signals are mixed and then simultaneously applied to the tape. Upon playback, the FM and converted chrominance signals are separated. The FM is demodulated into a luminance signal again. The converted chrominance signal is reconverted back up in frequency area of 3.58 MHz. The chrominance and luminance signals are combined which reproduces the original video signal.

#### 1. VIDEO HEAD

#### A. The Need for New Video Heads

We have already discussed the reduced track width. This reduction requires the use of a smaller video head. Just making them smaller does not make them better. With less of actual head material to work with, the magnetic properties of the head suffers. To offset this a change in the head material is in order. Because the VHS recorder is designed to be small, a reduction in the size of the head cylinder was called for.

A reduction in the size (diameter) of the head cylinder changes the head to tape speed. Remember, the head to tape speed affects the high frequency recording capability of the head.

To offset this problem, the head gap size was reduced. As is well-known. Azimuth Recording is utilized in VHS. The heart of the Azimuth Recording process is in the video heads themselves. This requires still another change in head design.

#### B. Head Gap

#### 1. Width

As explained, the need for smaller head gap size became apparent. In VHS, the video heads have gap widths of a mere  $0.3\mu m$  ( $0.3x10^{-6}$  meters).

This is quite a contrast with ordinary video heads used in other helical applications whose gap widths are typically in the area of  $1\mu m$ .

#### 2. Azimuth

Azimuth is the term used to define the left to right tilt of the gap if the head could be viewed straight on. In previous VTR applications the azimuth was always set to be perpendicular to the direction of the head travel across the tape, or more simply, the video track. Fig. 7 helps explain this.

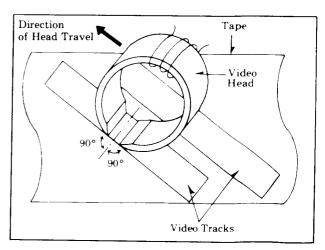


Fig. 7.

Fig. 7 shows that the gap is perpendicular to  $(90^{\circ})$  the head's movement across the tape. We can think of this standard as a perfect azimuth of  $0^{\circ}$ .

In VHS, the video heads have a gap azimuth other than 0°. And more, one head has a different azimuth from the other. The 2 values used in VHS are azimuth of +6° and -6°. Refer to Fig. 8 and Fig. 9.

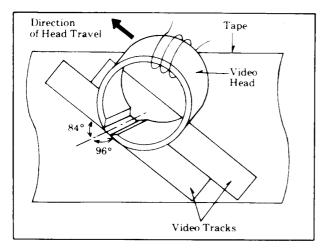


Fig. 8.

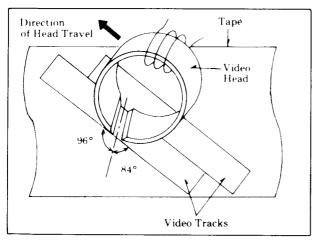


Fig. 9.

These heads make the VHS format different from most other VTR formats. Exactly how the azimuths of  $\pm 6^{\circ}$  helps to keep out adjacent track interference is explained next.

# 2. AZIMUTH RECORDING

Azimuth Recording is used in VHS to eliminate the interference or crosstalk picked up by a video head. Again, because adjacent video tracks touch, or crosstalk, a video head when scanning a track will pick up some information from the adjacent track. The azimuths of the head gaps assure that video head "A" will only give an output when scanning across a track made by head "A". Head "B", therefore, only gives an output when scanning across a track made by head "B". Because of the azimuth effect, a particular video head will not pick up any crosstalk from an adjacent track. Let's examine this more closely.

In Fig. 10, we can see the VHS/SLP for example, video tracks with not-to-scale North and South magnetized regions on them.

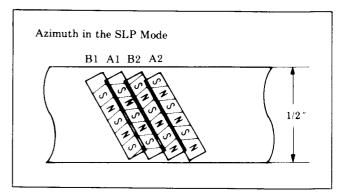


Fig. 10.

It can also be seen that these N or S regions are not perpendicular to the track, they have  $-6^{\circ}$  azimuth in tracks A1, A2; and  $+6^{\circ}$  azimuth in tracks B1, B2.

If we take track A1 and darken the N regions, it becomes easier to see. Refer to Fig. 11.

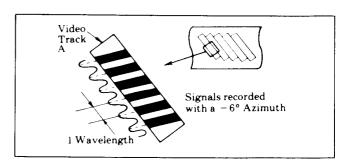


Fig. 11.

In Fig. 12, we see the information on track A, made by head "A". Imagine now that head "A" is going to playback this track, by superimposing the head over the track. Clearly, the gap fits exactly over the N and S regions, so that at any moment there is either an N region or an S region or an N to S (or S to N) transition across the gap. This produces maximum output in head 'A'. Now, visually superimpose the "B" head over the track.

Here there are N and S regions across the gap at the same time, at any given moment. Remember that simultaneous N and S regions across the gap cause cancellation, and therefore no output. Looking at Fig. 9, we can see that the gap width is equal to 1/2 the recorded wavelength. Recall that this occurs at the highest frequency which is to be recorded.

So therefore, the azimuth effect works at these high frequencies.

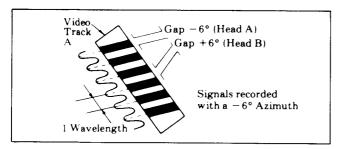


Fig. 12.

But what happens at lower frequencies? In Fig. 13, we see a diagram similar to Fig. 12, except the recorded wavelength is longer, which represents a lower frequency.

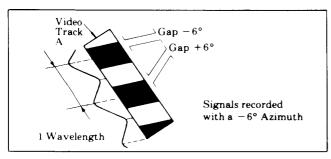


Fig. 13.

Again, visually superimpose the heads over the track. Head "A" is the same as before. But look at head "B". There is much less cancellation across the gap, and its output is close to that of head "A". Therefore, we see where the azimuth effect is dependent on frequency. The higher the frequency, the better the azimuth effect. The lower the frequency, the lower the separation by azimuth effect.

#### 3. VHS COLOR RECORDING SYSTEM

Because there is insignificant azimuth effect at lower frequencies, a new color recording system must be adopted. The fact that crosstalk occurs at lower frequencies cannot be changed, this happens right at the tape during playback. The method adopted processes the crosstalk component signals from the heads so that they are eliminated. It is important to realize that the crosstalk DOES STILL OCCUR. It is the recording/playback circuitry that performs the elimination.

In ordinary Helical VTR's using converted subcarrier direct recording, the phase of the chrominance signal is untouched, recorded directly onto the tape. The chrominance signal and its phase can be represented by vectors. Vectors graphically represent the amplitude and phase of ONE frequency. In this discussion, we will consider (for simplicity) the chrominance signal to be of one frequency. As an example of vectors, see Fig. 14.

The length of any vector represents its amplitude.

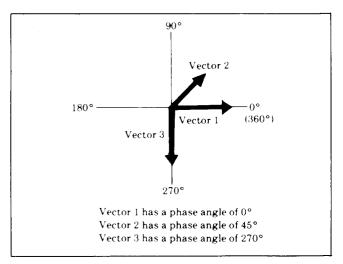


Fig. 14.

We know that the azimuth effect will not work at the lower frequencies. And since the color information in VHS is recorded at low-converted frequencies, a new method of color recording was adopted.

Vector Rotation in Recording is actually a phase shift process that occurs at a horizontal rate, 15,734Hz.

The chrominance signal can be represented by a vector, showing amplitude and phase. ( $\blacktriangle$ )

In ordinary Helical Scan VTR's the vector is of the same phase for every horizontal line, on every track as shown in Fig. 15.

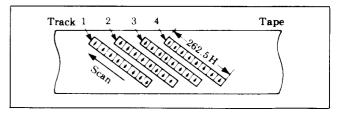


Fig. 15.

In VHS, we still convert the 3.58 MHz down to a lower frequency, namely 629 kHz, but the new color method used in VHS format is a process of vector rotation. During recording the CHROMINANCE phase of each horizontal line is shifted by 90°.

For head "A" (CHANNEL 1) we ADVANCE the CHROMINANCE phase by 90° per horizontal line (H).

For head "B" (CHANNEL 2) we DELAY the chrominance phase 90° per H.

**VECTOR (PHASE) ROTATION:** 

CHANNEL 1  $+90^{\circ}/H$ 

CHANNEL 2 -90°/H

Fig. 16 shows what this looks like on tape.

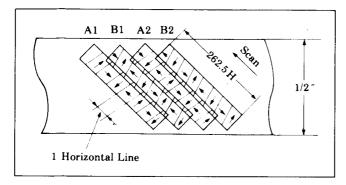


Fig. 16.

Now assume that head "A" plays back over track A1 it will produce a vector output as such:

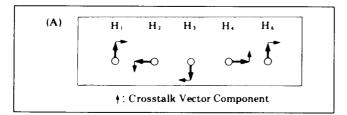


Fig. 17.

Head "A" when tracking over A1 will have an output consisting of the main signal (large vectors) and some crosstalk components (small vectors).

Fig. 17, then is a vector representation of the playback chrominance signal from the head.

One of the most important things down in the playback process is the restoration of the vectors to their original phase. This is done by the balanced modulator in the playback process.

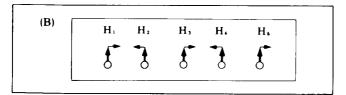


Fig. 18.

This restored signal is then split 2 ways. One path goes to one input of an adder. The other path goes to a delay line which delays the signal by 1 H. The output of the delay line goes to the other input of the adder. Fig. 19 explains.

As can be seen in Fig. 21, the crosstalk component has been eliminated after the first H line. We have now a chrominance signal free of adjacent channel crosstalk.

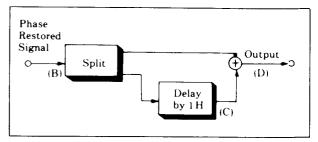


Fig. 19.

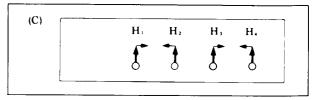


Fig. 20.

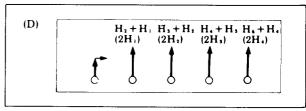


Fig. 21.

The double output in Fig. 21 is not a problem because it can always be reduced. The process of adding a delayed line to an undelayed line is permissable because any 2 adjacent lines in a field contain nearly the same chrominance information.

So, if 2 adjacent lines are added, the net result will produce no distortion in the playback picture.

In conjunction with the crosstalk elimination is the reconversion of the chrominance 629 kHz to its original 3.58 MHz. Now the color signal is totally restored.

# GLOSSARY OF TERMS

#### ACC

Automatic Color Control used to maintain an overall constant color signal level in the color circuits.

#### ACK

Automatic Color Killer.

#### Adjacent Track

This is the name of the video track to the immediate left or right of the track of concern.

#### **AFC**

Automatic Frequency Control used to phase-lock the color circuits to either the recording or playback color signal, in order to achieve a stable color signal.

#### AFT

Automatic Fine Tuning... This is a special circuit found in most recent TV sets which makes the local oscillator of the TV tuner follow the channel of concern in order to produce a stable IF frequency. In other words, if for any reason the TV station being received changes frequency, the AFT circuit will automatically compensate so that no interference will be seen on the screen, i.e., no manual fine tuning is necessary.

#### AGC

Automatic Gain Control used to maintain an overall constant picture level in the luminance circuits.

#### APC

Automatic Phase Control used to help phase lock the color circuits to either the recording or playback color signal in order to achieve a stable color signal.

#### Azimuth

A term used to describe the left to right tilt of the gap of a recording head, if it could be viewed straight on.

#### **Balanced Modulator**

A circuit so designed to give as an output the frequency sum or frequency difference of its two input signals. Any special characteristics of one of the input signals will be present in the output signal.

#### Beats

A term used to described the unwanted signals produced when two original signals are allowed to be mixed together.

#### Bipolar PG

Pulse Generator signals that have both positive and negative excursions.

#### Burst

A short time occurence (8 to 10 cycles) of the 3.58 MHz subcarrier signal, appearing right after horizontal sync but centered on the blanking portion of the video waveform. Burst is used to keep the color oscillator of a TV receiver locked to the broadcast station.

#### B/W

Abbreviation for Black and White.

C

Capacitor.

# C Signal

The color portion of a video signal.

#### Capstan

A small rotating metal dowel which drives the recording tape to assure positive tape movement.

#### Chroma

The color portion of a video signal.

#### Chrominance

The color portion of a video signal.

#### Clami

The process of giving an AC signal a specific DC level.

#### Control Signal

A special signal recorded onto the video tape which is used during playback as a reference for the servo circuits.

#### Converted Subcarrier

This is the process of frequency shifting the color 3.58 MHz subcarrier and its sidebands down to 629 kHz.

#### Crosstalk

The name given to the unwanted signals obtained when a video head picks up information from an adjacent track.

#### CUE

To scan the playback picture at a faster than normal speed in the Forward direction.

D

Diodė.

DL

Delay Line.

#### DDO

Direct Drive Cylinder...as used in VHS, this means that the video heads are driven by a self-contained brushless DC motor using no belts or gears. DD cylinders produce pictures with better stability.

#### Dark Clip

After emphasis, the negative going spikes (undershoot) of a video signal may be too large in amplitude for safe FM modulation. A dark clip circuit is used to cut off these spikes at an adjustable level.

#### Delta Factor ( $\Delta f$ )

A term used to indicate that a playback signal off the video tape has some jitter or "wow and flutter".  $\Delta f$ , or "a change in frequency" means that the color signal off the tape is not a stable frequency of 629 kHz, but rather a signal whose frequency at any instant is some small amount above or below 629 kHz.

#### Deviation

A term used to describe how far the FM carrier swings when it is modulated. In VHS the upper limit is 4.4 MHz.

#### Dew Detector

A variable resistor whose resistance value depends upon the ambient humidity.

#### Dihedral

A term used to describe the relative position between the two video heads as they are mounted in the head cylinder. Perfect dihedral means that the tips of the heads are exactly  $180^{\circ}$  apart:

#### Dropout

A momentary absence of FM or color signal off the tape, whether due to uneven oxide or a coating of dust on the tape or video heads.

#### **Duty Cycle**

In describing a rectangular waveform, the "duty" refers to the percentage of off time and on time for one complete cycle. 50-50 means that there are equal periods of off time and on time for one cycle and this would be a square wave.

#### E-E

Electronics to Electronics...this is the picture viewed on the TV set when a recording is being made. This picture goes through some but not all of the circuits of the recorder and is used to test the operation of said circuits.

#### EQ

Shortened form of "Equalization", used in the audio circuits.

#### **Emphasis**

The process of boosting the level of the high frequency portions of the video signal.

#### FG

Frequency Generator used in the servo circuits.

#### FL

Filter.

#### FM Signal

The luminance portion of the video signal is used to control the frequency of an astable multivibrator. The output of this multivibrator is a frequency modulated (FM) signal shifting from 3.4 MHz to 4.4 MHz (plus sidebands).

#### Field

One half of a television picture. A field consists of 262.5 horizontal scanning lines across the picture tube. Two fields are necessary to complete a fully scanned TV picture (frame). First, one field is "sprayed" on the picture tube, starting at the top of the tube with Line I, and ending at the bottom with Line 262.5. Then, the next field begins at the top of the tube again with Line 262.5 and ends at the bottom with Line 525. The lines of the second field lie inbetween the lines of the first field. This property of falling in-between lines is called "interlacing". The two sweeps of the picture tube, or two fields make up one complete TV picture or "frame". Frame repetition is 30 Hz, therefore field repetition is 60 Hz.

#### Flagwaving

This is the term used to describe a TV sets ability to accept unstable playback pictures from a video tape recorder. All home VTR's have some degree of playback instability. A TV set with a long horizontal AFC time constant may not recover from the VTR's instability before the active picture is being scanned. This can cause a bending or flapping from side to side of the top inch or so of the screen. This movement is called "flagwaving".

#### Frame

One complete TV picture. See "Field".

#### Gate

A circuit which will deliver an output only when a specific combination of its inputs are present. For use in analog or digital applications.

#### Guard Band

This is the space between video tracks on the video tape in the SP mode. Guard bands contain no information.

#### Hall Effect IC

An external magnetic field causes current to flow in this type of device.

#### HD

Horizontal Drive signal.

#### Head Cylinder

A cylindrical piece of metal which houses the video heads. The tips of the heads protrude slightly from the surface of the cylinder so that they may scan the tape as the cylinder spins.

#### Head Switching

The action of turning off, during playback, the video head which is not in contact with the video tape. A particular video head will be turned off 30 times per second. This is done so that the head which is not scanning the tape, and therefore not delivering a good signal, cannot contribute any noise to the playback signal.

#### Head Switching Pulse

The signal which is applied to the Head Amplifier to perform head switching. This is a square wave at 30 Hz, with a 50-50 duty cycle.

#### Helical

A word used to describe a general type of VTR in which the tape wraps around the video head cylinder in the shape of a 3-dimensional spiral, or "helix". The video tracks are recorded as a series of slanted lines.

#### IC

Integrated Circuit.

#### Interchangeability

A term used to describe how well a particular VTR will play back a tape recorded on another VTR of the same type. Good interchangeability indicates good playback.

#### Interlacing

The property of the scan lines of two television fields to lie in-between each other. See "Field".

#### Interleaving

A term used to indicate that the harmonics of the chrominance signal lie in-between the harmonics of the luminance portion of the video signal as it is viewed on a spectrum analyzer. This means that the color information of a video signal does not interfere with, although it is broadcast at the same time as, the luminance information.

Also, signals which have this interleaving property are not readily seen on a TV screen, because of their virtual cancellation characteristics.

Interleaving signals (fi) must have the following frequency relationship:

fi = 
$$(\frac{2n+1}{2})$$
 x fH (n=0, 1, 2, 3, 4.....)  
fH = 15,734 Hz (H sync frequency)

#### Jitter

The name of the effect on the playback picture if a VTR has too much "wow and flutter". The picture appears to have a rapid shaking movement.

L

Coil.

#### Luminance

This is the portion of video signal which contains the sync and B/W information.

#### MMV

Monostable Multi-Vibrator...Usually an IC device which gives a logic high or low output with a variable duration upon receipt of an input pulse or transition.

#### Non-Linear Emphasis

This is similar to regular emphasis with the difference that small level high frequency portions of the signal are given more of a boost than higher level high frequency portions.

#### NTSC

The National Television Systems Committee. These four letters identify the United States color television standard.

PC

Pulse Generator used in the servo circuits.

Q

A term used to describe the graphic response of a filter or tuned amplifier.

R

Resistor.

#### Review

To scan the playback picture at a faster than normal speed in the Reverse direction.

#### RF

Radio Frequencies.

#### Rotary Chroma

The name of the process used in VHS to change the phase of the chrominance signal at a rate of 15,734 (same as H sync frequency) times per second.

#### Rotary Transformer

A device used to magnetically couple RF signals to and from the spinning video heads, thus eliminating the need for brushes.

#### Sample and Hold

A process used in comparator circuits by which the value of a particular signal is measured at a specific moment in time ...then this value is stored for later use.

#### Search

To scan the playback picture at a faster than normal speed in either the forward or reverse direction.

#### Servo

Short for Servo mechanism. This is an electro-mechanical device whose mechanical operation (for instance motor speed) constantly being measured and regulated so that it closely matches or follows an external reference.

# Skew

Another way of saying Tension Error. Skew is actually the change of size or shape of the video tracks on the tape from the time of recording to the time of plyaback. This can occur as a result of poor tension regulation by the VTR, or by ambient conditions which affect the tape.

#### Subcarrier

The name of the 3.58 MHz continuous wave signal used to carry color information.

SS

Slow and Still.

T

Transformer.

TP

Test Point.

TR

Transistor.

#### Tension Error

See "Skew".

#### Time Base Stability

A term used to describe how closely the playback video signal from a VTR matches an external reference video signal...in regard to sync timing rather than picture content.

#### **Tracking**

This is the action of the spinning video heads during play-back when they accurately track across the video RF information laid down during recording. Good tracking indicates that the heads are positioning themselves correctly, and are picking up a strong RF signal. Poor tracking indicates that the heads are off track, and picking up low level RF signal or noise.

#### **VCO**

Voltage Controlled Oscillator...An oscillator whose frequency of oscillation is governed by an external voltage.

#### Video Head

This is the electro-magnet used to develop magnetic flux which will put RF information on the tape. In VHS, two video heads are mounted in a rotating cylinder around which the video tape is wrapped. As the cylinder spins, each video head is allowed to alternately scan the tape.

#### Video Track

The name of the RF information laid down during recording, as a particular video head scans across the tape.

#### VHS

Video Home System.

#### VTR

Video Tape Recorder.

#### VV

Video to Video...or...the actual playback picture produced from a tape during playback.

# vxo

Voltage Controlled Crystal Oscillator...Similar to VCO except that a quartz crystal is sued as a reference which can be varied.

#### White Clip

After emphasis, the positive going spikes (overshoot) of the video signal may be too large for safe FM modulation. A white clip circuit is used to cut off these spikes at an adjustable level.

#### **XTAL**

Abbreviation for crystal.

#### Y Signal

The B/W portion of a video signal containing B/W information and sync.

# Service Manua

Vol. 2

Mechanical Adjustment **Procedures** Electrical Adjustment **Procedures** 

Portable Video Cassette Recorder Panasonic VHS



# **SPECIFICATIONS**

Power Source:

12 VDC

Battery LCS-2012P Elec. Tuner Unit PV-A200 Prog. Tuner Unit PV-A500 Multiple AC Adaptor PV-A100 Plug-in AC Adaptor PV-A110 Approx. 7W at Play mode

Power Consumption: Television System:

EIA Standard (525 lines, 60 fields)

NTSC color signal

Video Recording

System: 2 rotary heads helical scanning system

Luminance: FM azimuth recording Chrominance: Converted subcarrier phase shift recording

Audio Track:

Tape width 1/2" (12.7 mm), high density Tape Format:

Tape Speed: SP mode: 1-5/16 i.p.s (33.35 mm/s)

LP mode: 21/32 i.p.s (16.67 mm/s) SLP mode: 7/16 i.p.s (11.12 mm/s)

Record/Playback Time: 360 min. with NV-T120 used in SLP

mode

FF/REW Time:

Less than 6 min. with NV-T120

Heads:

Video: 2 Rotary heads

Audio/Control: 1 stationary head

Erase: 1 full track erase

1 audio track erase for audio dubbing

Input Level:

Video: VIDEO IN Jack (RCA type)

 $1.0\,\mathrm{Vp}$ -p,  $75\Omega$  unbalanced

Audio: MIC IN Jack

 $-70 \, \mathrm{dB}$ ,  $600 \, \Omega$  unbalanced

Output Level:

Video: VIDEO OUT Jack (RCA type)

 $1.0\,\mathrm{Vp}$ -p,  $75\Omega$  unbalanced

Audio: AUDIO OUT Jack (RCA type)

 $-6\,\mathrm{dB}$ ,  $600\Omega$  unbalanced

RF Modulated: Ch3/Ch4 switchable,

72 dBμ (open voltage),  $75\Omega$  unbalanced

Video Horizontal

Resolution: More than 230 lines

Audio Frequency

Response: SP: 100 Hz~8 kHz, (10 dB down) LP: 100 Hz ~ 6 kHz, SLP:  $150 \, \text{Hz} \sim 5 \, \text{kHz}$ 

Signal-to-Noise Ratio: Video: SP mode: better than 40dB

LP mode: better than 40dB SLP mode: better than 40dB (Rohde & Schwarz noise meter) Audio: SP mode: better than 42dB LP mode: better than 40dB

SLP mode: better than 40dB

Operating

Weight:

Temperature:  $32^{\circ}F \sim 104^{\circ}F$  ( $0^{\circ}C \sim 40^{\circ}C$ )

Operating Humidity:  $10\% \sim 75\%$ 

8.4 lbs (3.8 kg) (with internal battery pack)

Dimensions:  $9-3/8"(W) \times 3-5/8"(H) \times 9-9/16"(D)$ 

 $238(W) \times 92.5(H) \times 242(D) mm$ 

Weight and dimensions shown are approximate. Specifications are subject to change without notice.

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# MECHANICAL ADJUSTMENT PROCEDURES

## DISASSEMBLY OF CABINET PARTS

#### 1. DISASSEMBLY FLOWCHART

This flowchart indicates disassembly steps of the cabinet parts and the Bottom P.C.B.s in order to gain access to the items necessary for servicing. When reassembling, perform the steps in the reverse order. The bottom plate can be removed individualy.

#### Notes:

- 1. When removing the front panel, work with care so as not to break the locking portions.
- 2. Adjustments are required if the Cassette Up Holder was replaced.

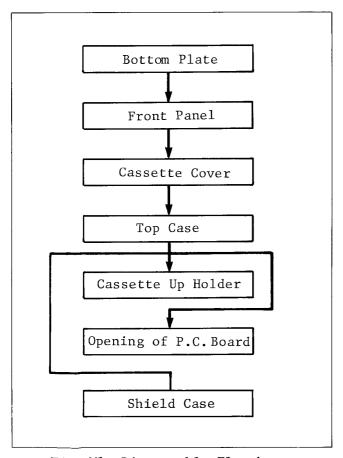


Fig. Ml Disassembly Flowchart

#### 2. DISASSEMBLY METHOD

#### Notes:

- a. Place the cloth or any other soft materials under the PC Boards or deck for preventing them being damaged while servicing.
- b. When reinstalling, ensure the connectors are connected and any electrical components are not damaged.

#### 2-1. Removal of the Bottom Plate

- 1. Place the deck upside down so the bottom plate faces upward.
- 2. Remove 5 screws (A). Then remove the bottom case by lifting the rear portion of it.

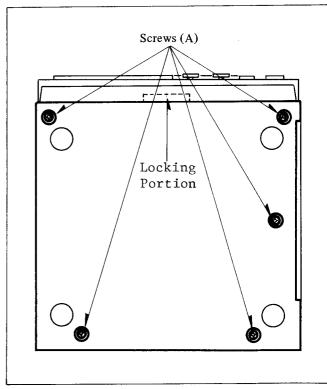


Fig. M2 Removal of the Bottom Plate

#### Note:

When reinstalling, first insert the locking portion into the slot of the front panel.

## 2-2. Removal of the Front Panel

1. Remove the 2 switching knobs, unlock the locking portions and hold the both right and left ends of the front panel. Then carefully lift and turn the top portion of it to remove. And remove the Slow Tracking Control Volume.

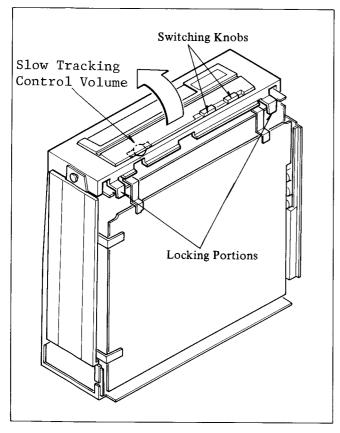


Fig. M3. Removal of the Front Panel

#### Note:

Work this step with extreme care for not being damaged on the locking portions.

# 2-3. Removal of the Cassette Cover

Supply the power to the deck and turn it on. Then press the EJECT button to raise the cassette up holder.

Remove 2 rubbers and 2 screws (B). Then carefully lift and turn the front portion of it to remove. Pay attention for not being damaged on the locking portions.

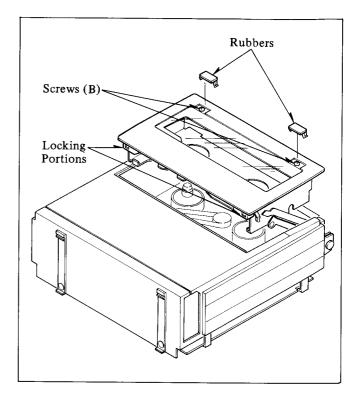


Fig. M4. Removal of the Cassette Cover

#### Note:

When reinstalling, first suit the locking portions of the cassette holder unit.

#### 2-4. Removal of the Top Case

- 1. First confirm that the battery is inside the battery compartment or not. If it is, take the battery
- 2. Remove 2 screws (C). Then remove the top case.

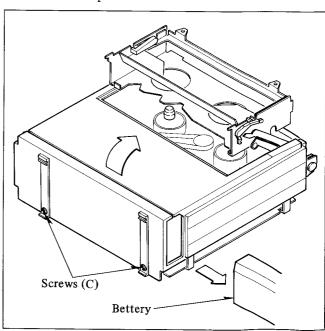


Fig. M5. Removal of the Top Case

# 2-5. Removal of the Cassette Up Holder

Remove 2 connectors P 40 and P 41. Then unlock the 4 locking portions and open the Front P.C. Board. Then remove 6 screws (D), and remove the cassette up holder.

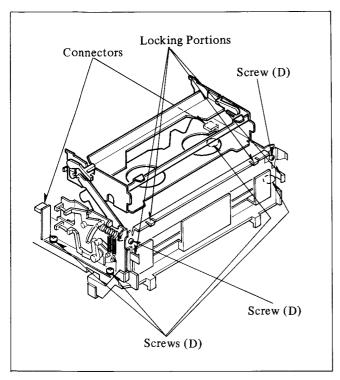


Fig. M6. Removal of the Cassette Up Holder

## Note:

When this part was removed or replaced the final adjustment is required. Refer to "ADJUSTMENT OF CASSETTE UP HOLDER" section.

# 2-6. Opening of the P.C. Board

Unlock the 6 locking portions and disconnect the connector P 1 then open the P.C. Board.

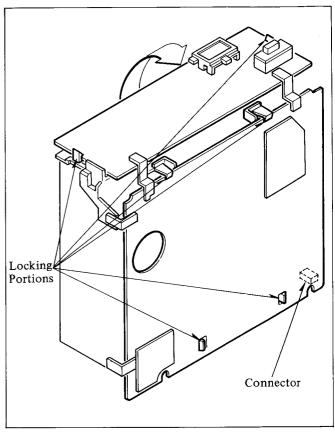


Fig. M7. Opening of the P.C. Board

#### 2-7. Removal of the Shield Case

Remove the 2 screws (E) and the plastic rivet. Then carefully lift it up to remove.

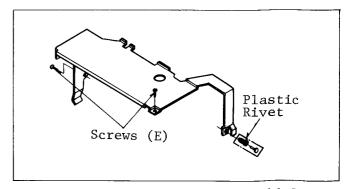


Fig. M7-1 Removal of the Shield Case

# **ADJUSTMENT PROCEDURES**

## 1. REPLACEMENT OF UPPER CYLINDER UNIT

Work with extreme care when removing or replacing the upper cylinder unit. Do not touch video heads duirng servicing.

- 1. Unsolder the 4 wires which are color corded to matching wires on the head relay board.
- 2. Remove the 2 screws and gently lift the upper cylinder unit from the shaft.

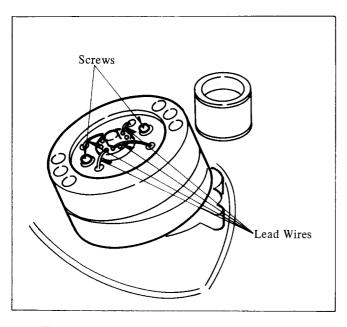


Fig. M8. Replacement of Upper Cylinder Unit-(1)

3. Before reinstalling a new unit, clean the D.D. cylinder shaft and the surface that engages with on the upper cylinder with a soft cloth dampened with freon liquid.

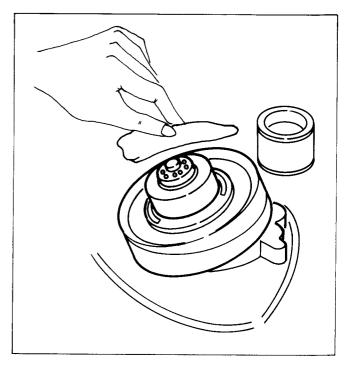


Fig. M9. Replacement of Upper Cylinder Unit-(2)

4. Install new unit so that the color code of the head relay board. Tighten the 2 screws and resolder the 4 wires to the head relay board.

#### Note:

Upon completion of replacement, confirm performance. And if required, perform "TAPE INTERCHANGEABILITY ADJUSTMENT".

#### 2. REPLACEMENT OF D.D. CYLINDER UNIT

Work with extreme care when removing or replacing the D.D. cylinder unit. Do not touch video heads during servicing.

- 1. Disconnect the connector cover on P 8 and 2 connectors P 8 (on top side) and P 47 (on bottom side) from the D.D. cylinder unit.
- 2. Remove the screw (A) and discharge angle.
- 3. Remove the D.D. cylinder unit and cylinder cover by removing 5 screws (B).

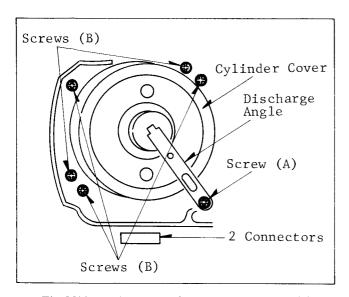


Fig. M10. Replacement of D.D. Cylinder Unit-(1)

#### Note:

Since there is very little clearance between D.D. cylinder unit and chassis, remove the D.D. cylinder unit gently and carefully.

4. Reinstall the new D.D. cylinder unit, restore the wires and connect the P 8 and P 47.

#### Notes:

1. When reinstall the New D.D. Cylinder Unit, fit the New D.D. Cylinder unit to the chassis by turn counterclockwise it.

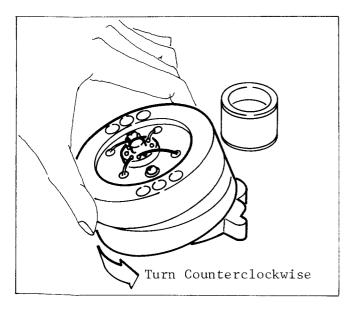


Fig. M11. Replacement of D.D. Cylinder Unit-(2)

2. Upon completion of replacement, confirm performance.

If any further maintenance is required, perform "TAPE INTER-CHANGEABPLITY ADJUSTMENT".

#### 3. ADJUSTMENT OF V-STOPPERS

Equipment Required: V-Stopper Adjustment

Fixture ..... (VFKS0016)

- 1. Remove the D.D. Cylinder Unit from chassis. (Upper Cylinder Unit is not required to be removed.)
  Refer to "REPLACEMENT OF D.D. CYLINDER UNIT" section.
- Keep 4 screws (A) loose, set the fixture.
   Push the V-stoppers snugly against the pins and tighten the 4 screws (A).

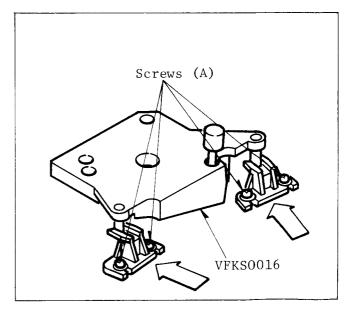


Fig. M12. Adjustment of V-Stoppers

# 4. CONFIRMATION OF BRAKE TORQUE

Equipment Required:

Dial Torque Gauge ..... (VFK0133) Adaptor for Gauge ..... (VFK0134)

- 1. Attach the adaptor to the torque gauge and place the deck in STOP mode.
- 2. Place the torque gauge on the reel table. The weight of gauge should not rest on the reel table.

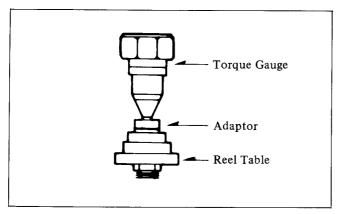


Fig. M13. Confirmation of Brake Torque-(1)

3. Turn torque gauge in either direction indicated in the Fig. M14 and read the gauge when the brake begins slipping.

#### Note:

If proper brake torque can not be obtained, clean the rotating surface of reel table with a soft cloth and recheck torque before replacing brake drum.

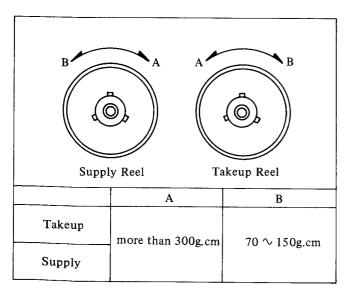


Fig. M14. Confirmation of Brake Torque-(2)

## 5. CONFIRMATION OF TAKEUP TORQUE

Equipment Requird:

Dial Torque Gauge .... (VFK0133) Adaptor for Gauge .... (VFK0134)

Specifications:

in PLAY mode ....... 100 $\sim$ 150 g.cm in F.F. mode ...... more than 400 g.cm in REW mode ...... more than 400

1. Attach the adaptor to the torque gauge.

g.cm

- 2. Cover the takeup and supply photo transistors with black tape. Lower the cassette up holder (with out cassette cover), and turn power switch on.
- 3. Place the torque gauge on the takeup reel table, push the play button and read torque on the gauge. Repeat in F.F. mode by pushing the F.F. button.

#### Note:

While measuring, the weight of the gauge should not rest on the reel table.

- 4. Set the torque gauge on the supply reel table, press the rewind button to check REW mode torque.
- 5. Remove the black tape that covered the the photo transistors.

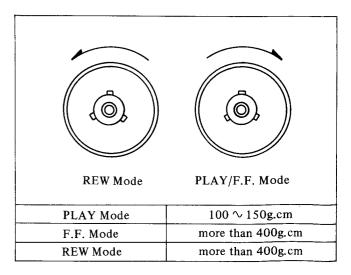


Fig. M15. Confirmation of Takeup Torque

#### 6. POSITION ADJUSTMENT OF TENSION POST

Equipment Required:

Tension Post Adjustment

Plate ..... (VFKS0015)

Fine Adjustment

Screwdriver ..... (VFK0136)

- Cover the photo transistor with black tape. Lower the cassette up holder (without cassette cover), and turn power switch on.
- Push the play button for loading.
   As soon as the loading is completed, disconnect the AC plug.
- 3. Then remove the cassette up holder.
- 4. Place the adjustment plate over the reels and slightly loosen the screw(A) securing the tension band bracket.
- 5. Insert the fine adjustment screwdriver into the hole and move the tension band bracket in either of direction so that the tension post just touches the adjustment plate. The tension post removes from the adjustment plate by turning the fine adjustment screwdriver counterclockwise. Then turn it clockwise until the tension post just touches the adjustment plate and tighten the mounting screw.

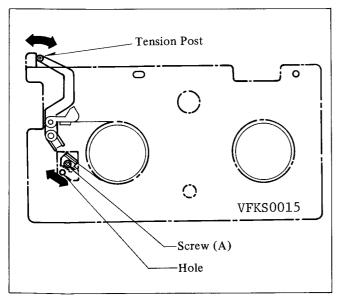


Fig. M16. Position Adjustment of Tension Post

7. MEASUREMENT AND ADJUSTMENT OF BACK TENSION

#### A. Measurement Procedure

Equipment Required:

Back Tension Meter (Tentelometer, Model T2-H7-UM, Purchase locally)
VHS Cassette Tape (120 Minutes tape)

Specification: 25  $^{\circ}$  30 g

- 1. Pull the erase head in the direction indicated by the arrow and hold it by adhesive tape.
- 2. Play back the cassette tape from is beginning and wait until tape running has stabilized. (for approx. 10 to 20 seconds)
- 3. Insert tention meter in tape path and confirm reading.
- 4. If the reading is out of spec., continuously perform the adjustment procedure.

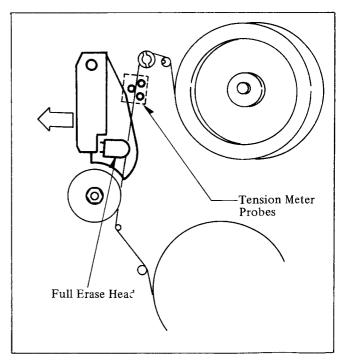


Fig. M17. Measurement of Back Tension

#### Notes:

- 1. Make sure that the three probes of the meter are all in good contact with tape, but out of contact with any parts while measuring.
- 2. It is recommended to be measured three times as tension meter is very sensitive.

# B. Adjustment Procedure

Equipment Required:
Fine Adjustment
Screwdriver ..... (VFK0136)

- 1. Loosen a screw (A) and insert the fine adjustment screwdriver into the hole (B).
- 2. Turn the screwdriver in either of direction indicated by the arrow to obtain the specified tension. Turn the screwdriver clockwise to lower tension, counterclockwise to raise it.

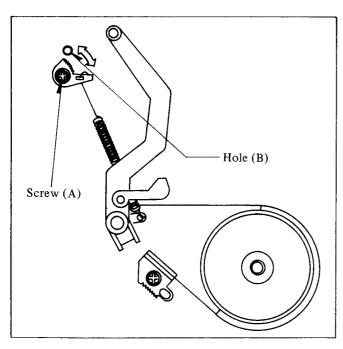


Fig. M18. Adjustment of Back Tension

3. Tighten the screw (A) and verify tension with the meter once again.

#### Note:

Upon completion of adjustment, remove the adhesive tape.

# 8. HEIGHT ADJUSTMENT OF REEL TABLES

Equipment Required:
Post Adjustment Plate .... (VFKS0010)
Reel Table Height Gauge .. (VFKS0009)

Specification .....  $\pm$  0.1 mm

- \* Cut-out surface of VFKS0010 is reference of height of reel tables and their height are measured based on this reference.
- 1. Place the post adjustment plate over the reels, and put the gauge on it. Set the gauge to zero "0" with the condition that the foot scraper of the gauge touches the cut-out portion of the plate.

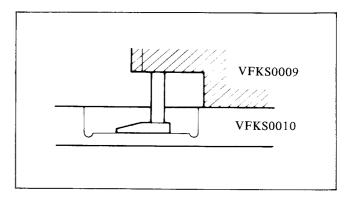


Fig. M19. Height Adjustment of Reel Tables-(1)

2. Then measure the top portion of reel table and confirm the difference against the condition just performed in former step. Do same for the other reel table.

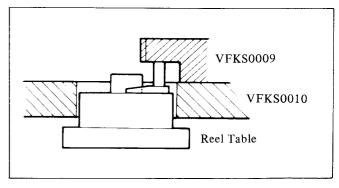


Fig. M20. Height Adjustment of Reel Tables-(2)

- 3. If the difference of reading of gauge between height at cut-out portion of VFKS0010 and the height of reel tables is more than 0.1 mm (higher or lower), adjust the height of reel to obtain the specified height.
- 4. For adjustment, change the poly slider washer located under the reel table. The washer is available in three sizes of thickness, t=0.13 mm, 0.25 mm and 0.5 mm.

# 9. HEIGHT ADJUSTMENT OF TAPE GUIDE POSTS

Equipment Required:	
Hex. Wrench (0.9mm)	(VFK0146)
Post Adjustment Plate	(VFKS0010)
Reel Table Height Gauge	
Nut Driver (5.5mm)	(Purchase
	Locally)
Post Adjustment	
Screwdriver	(VFK0137)

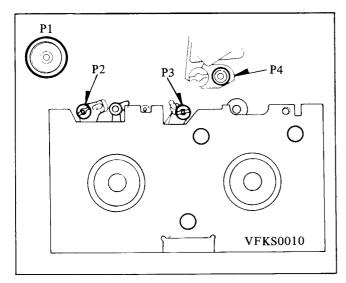


Fig. M21. Height Adjustment of Tape Guide Posts-(1)

1. First Install the post adjustment plate and lower all posts so that the condition as shown.

(Lower end of post, tape guide, should be lower than foot of gauge.) Loosen a hex. screw located on the lower portion of posts (P2 & P3) then turn the top of the posts with post adjustment screwdriver.

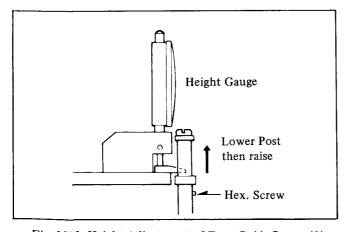


Fig. M22. Height Adjustment of Tape Guide Posts-(2)

2. Place the height gauge on the adjustment plate and fit the foot of gauge to the post. The condition to fit the foot should be as shown. (The foot of gauge should be fully lowered till it touches the plate.)

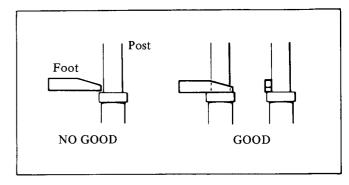


Fig. M23. Height Adjustment of Tape Guide Posts-(3)

3. Set the height gauge to zero and slowly raise the post until it just touches the foot of gauge. For adjustment of P1 & P4, use the nut driver.

#### Note:

Upon completion of adjustment, tighten hex. screws on P2 and P3 and install the post cap on P4. When the post cap on P4 is reinstalled, the direction of it should be as shown below viewing from the direction indicated by the arrow.

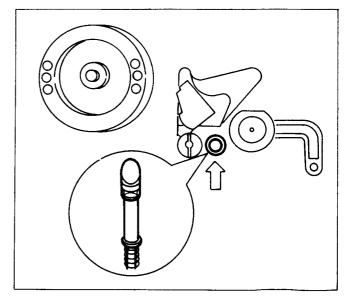


Fig. M24. Height Adjustment of Tape Guide Posts-(4)

## 10. HEIGHT ADJUSTMENT OF PULL OUT POST

#### Notes:

- 1. The adjustment should be performed after the adjustment of P4 as the spec. is based on height of P4.
- 2. The adjustment should be performed in the Loading completion mode.
- 3. Unless the replacement or adjustment of this post is completed, remove the AC plug.

Equipment Required:

Post Adjustment Plate .... (VFKS0010) Reel Table Height Gauge ... (VFKS0009) Nut Driver (5.5mm) ..... (Purchase Locally)

Specification: 0.02 mm  $\sim$  0.06 mm

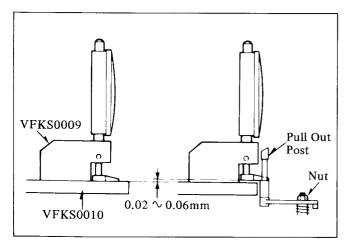


Fig. M25. Height Adjustment of Pull Out Post

- Turn power switch on, cover the takeup and supply photo transistors with black tape, press the cassette up holder down and push the play button for loading.
- 2. As soon as loading is completed, disconnect the AC plug and remove the cassette up holder.
- 3. Place the post adjustment plate, put the reel table height gauge on the plate and set height gauge to zero with condition the foot touches on the height adjustment plate.
- 4. Slightly lower the post by turning the nut clockwise. Fit the foot to the post so that the condition becomes as shown.

- 5. Then slowly and slightly turn the nut till the gauge reads specified height.
- 6. Reinstall the cassette up holder and remove the black tape that covered the photo transistors and plug in for unloading.

#### 11. TAPE INTERCHANGEABILITY ADJUSTMENT

#### Note:

To perform these adjustment/confirmation procedures, make sure that the track-ing control is set into the detent (fixed) position.

Equipment Required:
Alignment Tape ...... (VFM8080H6)
Post Adjustment
Screwdriver ...... (VFK0137)
H-Position Adjustment
Screwdriver ...... (VFK0003)
Hex. Wrench, 0.9 mm ... (VFK0146)
Hex. Wrench, 1.5 mm ... (VFK75)
Nut Driver (5.5mm) .... (Purchase
Oscilloscope Locally)

# 11-1. Confirmation of Tape Travel

1. Play-back a cassette tape and confirm that the tape travels without curling at the edges of the tape.

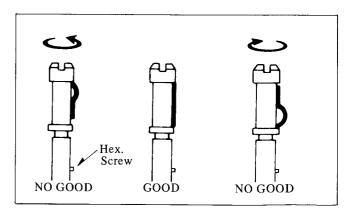


Fig. M26. Confirmation of Tape Travel

 If curling is apparent, adjust the height of posts by turning the top of post with the post adjustment screwdriver (for P2 & P3).

#### Note:

Before turning P2 and P3, slightly loosen a hex. screw.

# 11-2. Confirmation of A/C Head Height

#### Note:

Unless the A/C Head is replaced, this procedure should not be performed.

1. Looking at the lower edge of the control head with the tape running, ensure that the lower edge of the tape runs along the lower edge of the control head. If it doesn't, slightly turn the nut (A) in either direction to correct. Clockwise to lower the head and counterclockwise to raise it.

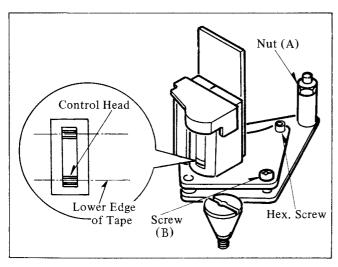


Fig. M27. Confirmation of A/C Head Height

# 11-3. Adjustment of A/C Head Height

- 1. Connect the oscilloscope to the audio output on the rightside of the deck.
- 2. Play-back the monoscope portion (6 kHz, Audio) of the alignment tape, VFM8080H6.

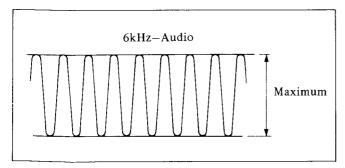


Fig. M28. Adjustment of A/C Head Height

3. Adjust the screw (B) on the head base so the output level becomes maximum.

# 11-4. Confirmation and Adjustment of Tilt of A/C Head

#### Note:

Unless P4 is adjusted, (See Fig. M24) this procedure should not be performed.

A.Confirmation Procedure
Play-back the tape and confirm that
the tape runs between lower and top
limiters of the post. If the lower
edge or top edge of the tape turns
with waving or frilling, then
correct the tilt of the A/C Head by
turning hex. screw. (A hex. screw
is shown in Fig. M27).

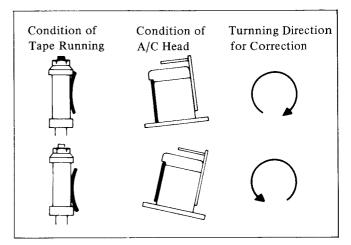


Fig. M29. Confirmation of Tilt of A/C Head

- B. Adjustment Procedure
- 1. Connect the oscilloscope to Test Point (TP8001).

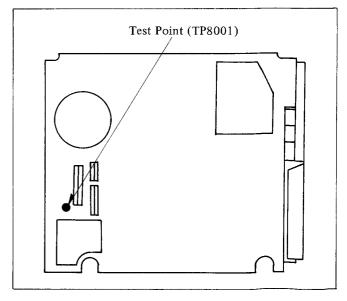


Fig. M30. Adjustment of Tilt of A/C Head-(1)

2. Play-back the monoscope portion of the alignment tape, VFM8080H6 and adjust the hex. screw so that the RF envelope output level is maximum. (See Fig. M31).

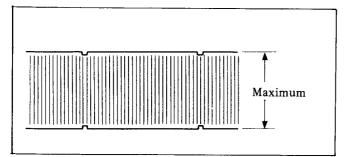


Fig. M31. Adjustment of Tilt of A/C Head-(2)

- 11-5. Horizontal Position Adjustment of A/C Head
  - 1. Set the tracking control to the detent (fixed) position. Connect the oscilloscope to the Test Point (TP 8001).
  - 2. Playback the monoscope portion of the alignment tape VFM8080H6 and confirm the envelope figure.
  - 3. If adjustment is required, set the H-position adjustment screwdriver into the slot of the adjustment nut and rotate in either direction to obtain maximum envelope output. (See Fig. M31 )

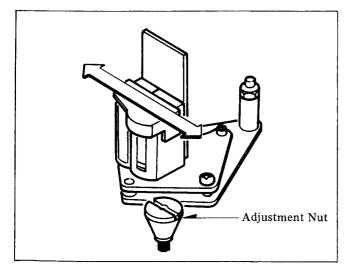


Fig. M32. Horizontal Position Adjustment of A/C Head

- 11-6. Confirmation/Adjustment of Envelope Output
  - 1. Set the tracking control in the detent (fixed) position. Connect the oscilloscope to Test Point (TP8001).
  - 2. Play-back the monoscope portion of the alignment tape VFM8080H6, adjust posts P2 and P3 while watching the scope display so that RF envelope on the scope becomes as flat as possible.

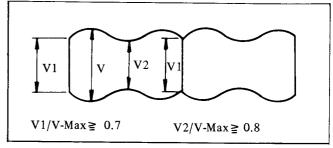


Fig. M33. Confirmation of Envelope Output

3. If the scope display is as follows, adjust the height of P2 shown in Fig. M21

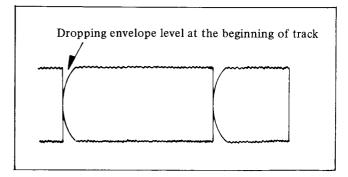


Fig. M34. Adjustment of Envelope Output-(1)

4. If the scope display is as follows, adjust the height of P3 shown in Fig. M21

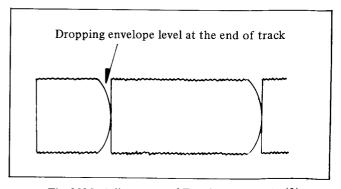


Fig. M35. Adjustment of Envelope Output-(2)

5. The scope display with P2 and P3 adjusted correctly should be as shown below.

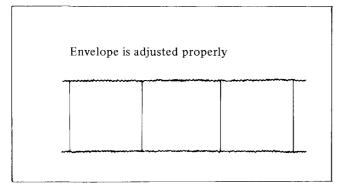


Fig. M36. Adjustment of Envelope Output—(3)

6. When adjustment is required, turn slowly and wait for servo lock.

Be sure the tape travels over the post as shown.

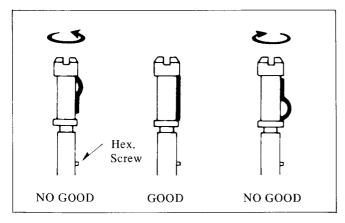


Fig. M37. Adjustment of Envelope Output-(4)

## 12. TENSION ADJUSTMENT OF TIMING BELT

Equipment Required:

Fan-type Tension Gauge (VFK66)

Specification:  $300 \pm 100 g$ 

- 1. Loosen a screw (A) and push the Idler Pressure Lever by the fantype tension gauge.
- 2. When the gauge reads the specified pressure, tighten a screw (A).

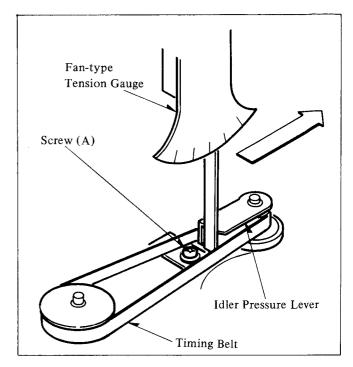


Fig. M38. Tension Adjustment of Timing Belt

## 13 ADJUSTMENT OF F.G. HEAD GAP

Equipment Required:

Fine Adjustment Screwdriver ... (VFK0136)

Specification:  $0.12 \pm 0.02 \text{ mm}$ 

1. Remove 2 screws (A) and thrust angle unit, then remove the sub plate, 5 screws (B) and stator unit.

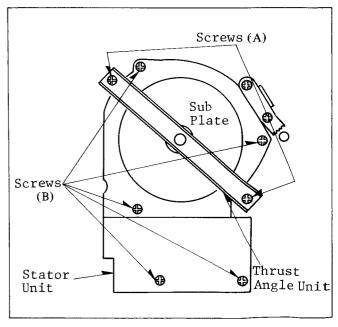


Fig. M39. Adjustment of F.G. Head Gap-(1)

2. Slightly loosen the 2 screws (C) and set the fine adjustment screwdirver into the hole (D). Turn screwdriver counterclockwise until the F.G. head touches the rotor and just slightly turn it clockwise so the gap becomes as specified.

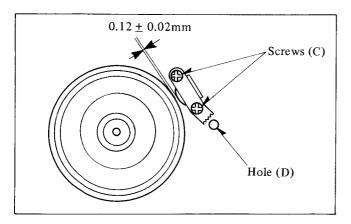


Fig. M40. Adjustment of F.G. Head Gap-(2)

c.f. Instead of this method, the cover page of this volume can be alternative because the thickness is approximately 0.12 mm.

#### Notes:

- 1. Do not touch the circumferential surface of rotor with any tool, and keep any magnetizable material away from the rotor magnet.
- 2. When reinstalling the stator unit, install it concentrially with boss of rotor.

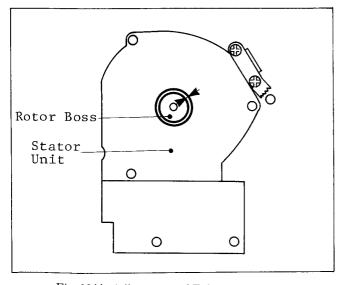


Fig. M41. Adjustment of F.G. Head Gap-(3)

14. CONFIRMATION/ADJUSTMENT OF THRUST GAP

Equipment Required:
Reel Table Height Gauge ... (VFKS0009)

Specification: 0.02 ∿ 0.10 mm

- 1. Place the height gauge on the thrust angle, and set the gauge to zero "0".
- 2. Next, push the capstan shaft by your finger, and confirm the thrust gap.
- 3. If the gap is out of specification, then adjust the thrust boss by turning it clockwise or counterclockwise.

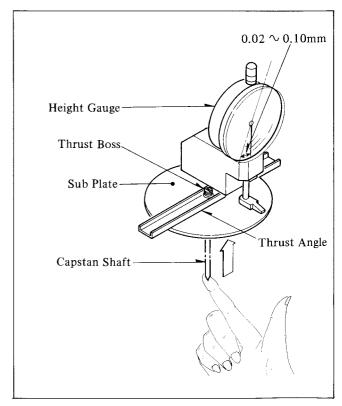


Fig. M42. Confirmation/Adjustment of Thrust Gap-(1)

#### Note:

Upon completion of above procedure adjust the capstan seal so that this seal is out of contact with the pressure roller and capstan holder. The specification of clearance is approximately 0.1  $\sim$  0.5 mm.

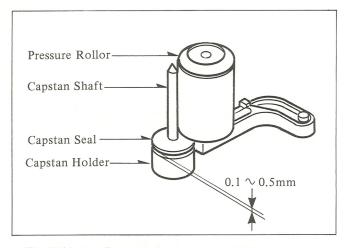


Fig. M43. Confirmation/Adjustment of Thrust Gap-(2)

- 15. ASSEMBLY AND ADJUSTMENT OF GEARS AND RODS
- Install the supply and takeup loading arm units so that the projection
   (A) on the takeup loading gear aligns with the delta "Δ" mark (B) on the supply loading gear.
   Then install the 2 retaining rings. Ensure that the loading arm units is still in the fully unloaded condition.

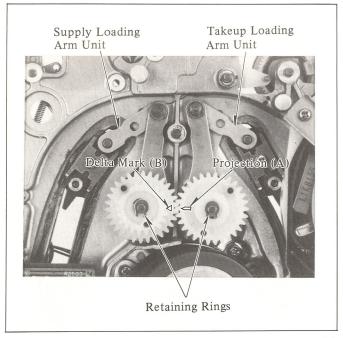


Fig. M44. Assembly and Adjustment of Gears and Rods-(1)

#### Note:

Pay attention that the washers are remaining under the loading gears.

2. Install the sector gear (II). Next install the sector gear (III) so that the convex on the sector gear (III) fits in with the concave on the sector gear (II).

Then install the retaining ring.

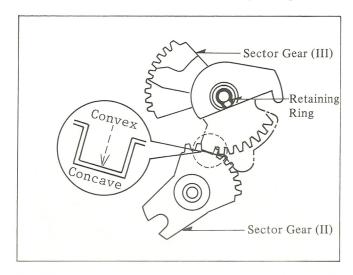


Fig. M45. Assembly and Adjustment of Gears and Rods-(2)

Next, align the delta " $\Delta$ " mark (C) on the sector gear (III), rib (D) on the sector gear (II) and the shaft (E) as they are on one line.

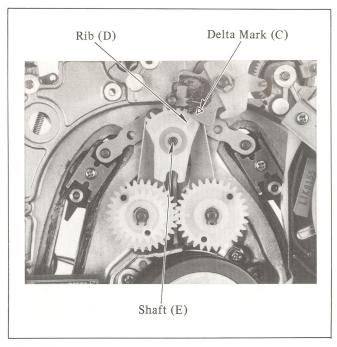


Fig. M46. Assembly and Adjustment of Gears and Rods-(3)

Then install the sector gear (I) so that the hole (F) on the sector gear (I) aligns with the projection (G) on the supply loading gear. Then install the retaining ring.

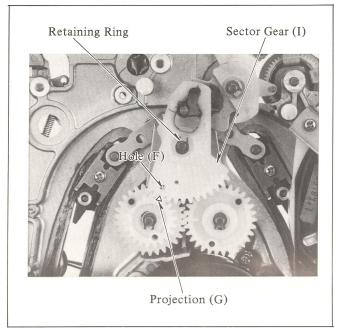


Fig. M47. Assembly and Adjustment of Gears and Rods-(4)

3. Install the sub cam gear so that the hole on gear meets the hole on the chassis.



Fig. M48. Assembly and Adjustment of Gears and Rods-(5)

4. Install the 4 washers.
And install the sub rod unit so
that the pin on the sub rod unit
fit into the sub cam gear.

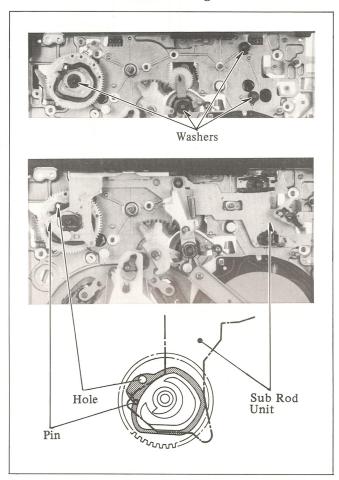


Fig. M49. Assembly and Adjustment of Gears and Rods-(6)

Then install the 4 washers, 2 retainings and 2 springs (H).

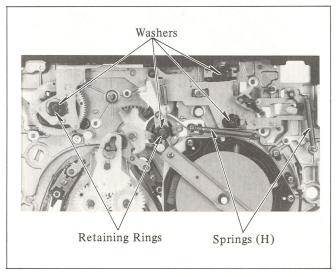


Fig. M50. Assembly and Adjustment of Gears and Rods-(7)

5. Confirm the sub cam gear is keeping the condition described in step 3. Then, install the main cam gear so that the hole (J) on the main cam gear aligns with the hole (K) on the sub cam gear.

And install the washer.

And install the washer.

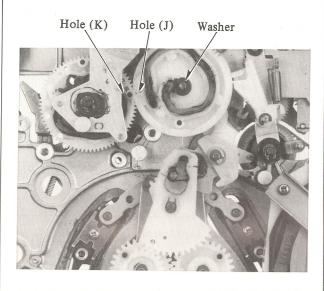


Fig. M51. Assembly and Adjustment of Gears and Rods-(8)

6. Install the main rod unit so that the pin (L) on the main rod unit fits into the part (M) on the sub rod unit.

Then install the 3 washers and 4 retaining rings.

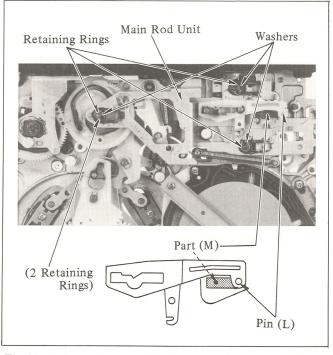


Fig. M52. Assembly and Adjustment of Gears and Rods-(9)

7. Confirm the sub cam gear is keeping the condition described in step 3. Then, install the eject stopper unit, screw (N), spring (P), eject kick lever unit, retaining ring and spring (Q).

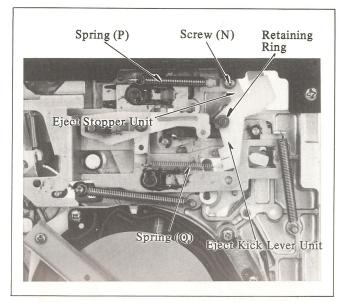


Fig. M53. Assembly and Adjustment of Gears and Rods-(10)

#### Note:

Do not transform the springs when installing them.

8. Confirm the sub cam gear is keeping the condition described in step 3. Rotate the gear on the rotary switch so that it becomes click (detent) position, then install the switch with 2 screws (R).

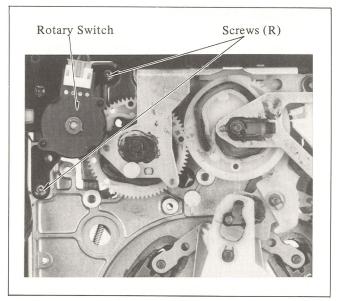


Fig. M54. Assembly and Adjustment of Gears and Rods—(11)

There is one click point per 4 rotations.

9. Rotate the sub cam gear counterclockwise by your finger and make short loading. Then rotate it clockwise till the deck becomes the STOP condition.

Then, install the loading motor with 3 screws (S) and connect the connector P 14 .

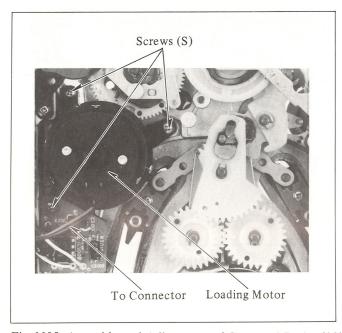


Fig. M55. Assembly and Adjustment of Gears and Rods—(12)

16. POSITION ADJUSTMENT OF CASSETTE UP HOLDER

Equipment Required:

Cassette Holder Fixture ... (VFKS0017)

- Supply power to the deck and make EJECT condition. Then turn power off.
- 2. Remove 2 screws (A) and loosen a 4 screws (B).
- 3. Insert the fixture and push it all the way in until it touches the tabs on the cassette holder. Hold the fixture and cassette holder together with your hand, then slowly lower it while watching all holes and cut-outs until the cassette holder latches.
- 4. Press the center portion of the fixture and adjust the position so as to clear the reels, then tighten the 4 screws (B). And Tighten the 2 screws (A).

5. Supply power again and ensure smooth movement by repeatedly pressing down and ejecting the cassette holder.

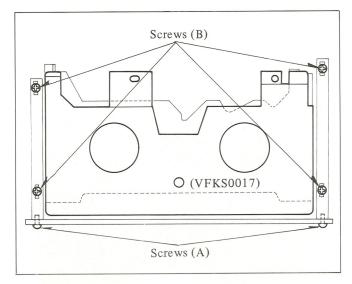


Fig. M56. Position Adjustment of Cassette Up Holder

#### 17. ADJUSTMENT OF LEAF SWITCHES

Equipment Required:
Leaf Switch Adjustment Fixture
.... (VFKS0018)
Fine Adjustment Screwdriver
.... (VFK0136)

- 1. Remove the Cassette Up Protector (plastic cover) on the leaf switches.
- 2. Set the fixture to the lock roller pin and lower edge of cassette up holder.
- 3. Slightly loosen a screw (A) and insert the adjustment screwdriver to the hole (B).
- 4. Adjust the gap(C) so that the up lever and down lever just touches with leaf switches by turning adjustment screwdriver, then tighten a screw (A).
- 5. Upon completion of adjustment, confirm the condition of leaf switches. (See Fig. M58)

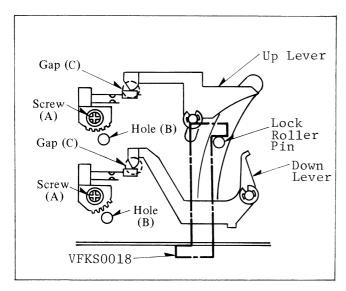


Fig. M57. Adjustment of Leaf Switches

Leaf Switches Cassette Up Holder	Up Side Leaf Switch	Down Side Leaf Switch
UP	ON	ON
DOWN	OFF	ON

Fig. M58 Confirmation of Leaf Switch

# 18. POSITION ADJUSTMENT OF RECORDING SAFETY SWITCH

Equipment Required:
Cassette Holder Fixture ... (VFKS0017)
Hex. Wrench (0.9mm).....(VFK0146)

- 1. Place the fixture in place over the reel tables.
- 2. Insert the hex. wrench into the hex. screw. Turn hex. wrench in either direction till the switch closes.

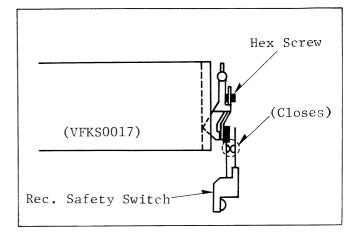


Fig. M59 Position Adjustment of Recording Safety Switch-(1)

#### Note:

When cassette with an erase tab is used, the switch closes, and without a tab, it opens.

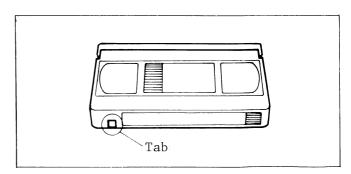


Fig. M60 Position Adjustment of Recording Safety Switch-(2)

### Servicing Fixtures & Tools VFM8080H6 VHS Alignment Tape VFK0137 Post Adjustment VFKS0003 H-Position Adj Fixture Screwdriver **Back Tension Meter VFKS0010** Post Adjustment Plate **VFKS0017** Cassette Holder Fixture (Tentelometer, Made in U.S.A.) VFK0133 Dial Torque Gauge **VFKS0009** Reel Table Height Fixture **VFKS0016** V-Stopper Adj Fixture VFK0180 (Plastic Flamper Only) 0180 VFK0134 VFKS0015 Adaptor for VFK0133 VFK27 Tension Post Adj. Plate **Head Cleaning Stick** Leaf Switch Adj. Fixture **VFKS0018** VFK0144 Retaining Ring Remover **MOR265** Morlytone Grease $(3 \mathbf{mm} \phi)$ VFK0136 Fine Adjustment VFK0146 Hex. Wrench (0.9 mm) VFK66 Fan-type Tension Gauge Screwdriver $(3 \text{ mm} \phi)$ VFK76 Hex. Wrench (1.5 mm)

#### ELECTRICAL ADJUSTMENT PROCEDURES

This section provides complete electrical adjustment procedures which may be required for electric circuits of 2/4/6 hour selectable portable VHS video cassette recorder.

#### 1. Test Equipment

To perform the electrical adjustments completely, the following equipment is required.

- 1. DVM (Digital Volt Meter)
  Voltage Range: 0.001 50V
- 2. Dual-trace Oscilloscope
   Voltage Range : 0.05 50V/Div.
   Frequency Range: DC 10MHz
   Probes: 10:1, 1:1
- 3. Frequency Counter
   Frequency Range: 0 10MHz
- 4. Signal Generator Sinewaye: 0 - 10MHz
- 5. Sweep Generator Frequency Range: 0 - 10MHz
- 6. Color TV Receiver or Monitor
- 7. Plastic Tip Driver
- 8. VHS Alignment Tape VFM8080H6



Fig. El

Start Counter Reading	0	017±4	092 ± 6	130 ± 10
Video	Blank	Monoscope	Color Bars	Multi-Burst
Audio	Blank	6KHz	3 KHz	1 KHz

Fig. E2

Adjustment Procedures
 Note: Components and Test Points in each section are series numbers.
 But for, easy alignment only the last numbers are used on P. C. Board.

These adjustment procedures consist of the following sections.

			SERIES
1.	A.V.R	. Section	1000
2.	System	m Control Section	6000
3.	Servo	Section	2000
4.	Audio	Section	4000
5.	Video	Section Luminance	3000
		Chrominance.	8000
6.	WIRED	REMOTE CONTROL UNIT SEC	TION

#### 2-1. A.V.R. Section

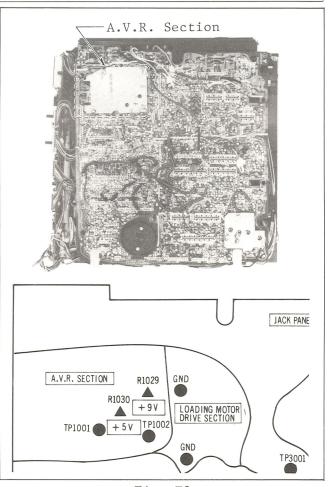


Fig. E3

#### 2-1-1. +9V, +5V Regulator Adjustment

Test Points: TP1001, TP1002

Adjustments: R1029 (+9V), R1030 (+5V)

- 1. Connect the Multi-connector to the deck so that +12V is supplied to the deck.
- 2. Place the unit in PLAY mode.
- 3. Connect the DVM to TP1001 on the A.V.R. section.
- 4. Adjust the  $\pm 9V$  (R1029) so that the voltage at TP1001 is 9.1  $\pm$  0.05V DC.
- 5. Connect the DVM to TP1002 on the same section.
- 6. Adjust the +5V (R1030) so that the voltage at TP1002 is  $5.1 \pm 0.05V$  DC.
- 7. Remove the DVM.

#### 2-2. System Control Section

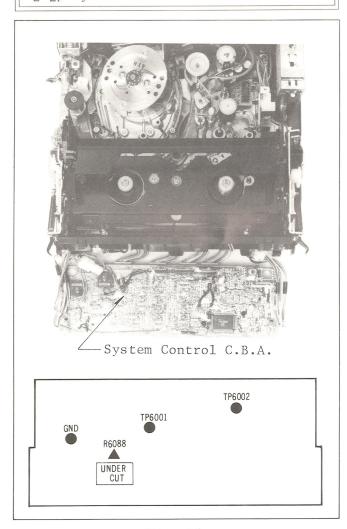


Fig. E4

#### 2-2-1. Under Cut Adjustment

Test Point: TP6001

Adjustment: R6088 (UNDER CUT)

- 1. Supply a video signal to the video input on the right side panel.
- 2. Don't connect the Multi-connector to the deck.
- 3. Turn the UNDER CUT (R6088) fully clock-wise from foil side.
- 4. Connect the DC Voltage Regulator to the battery terminal of the deck and set the voltage to 12V DC  $\pm$  0.1V DC.

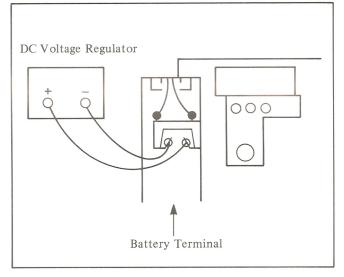


Fig. E5

- 5. Connect the DVM to the battery terminal of the deck.
- 6. Turn on the power switch of the deck.
- 7. Insert a cassette and make a recording.
- 8. Adjust the DC Voltage Regulator so that the voltage is 10.3 V DC  $\pm$  0.04V DC.
- 9. Then, slowly turn the UNDER CUT (R6088) on the system control section counter-clockwise until the unit is placed in the STOP mode.
- 10. Confirm that the "b" mark is indicated (flash) on the LCD counter for three seconds.

Then the power switch of the deck is automatically turned OFF.

#### 2-3. Servo Section

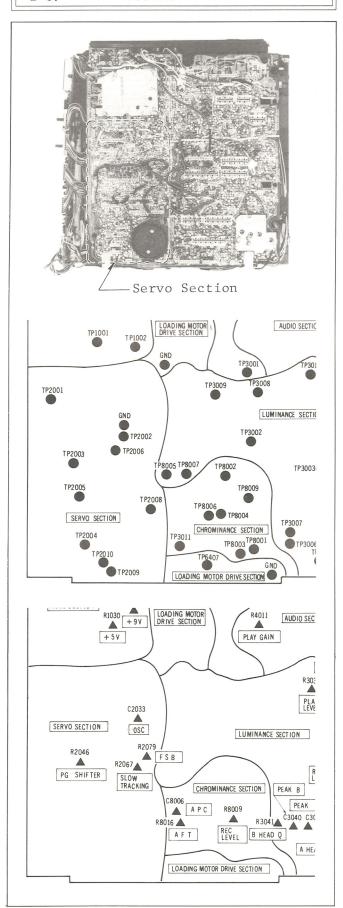


Fig. E6

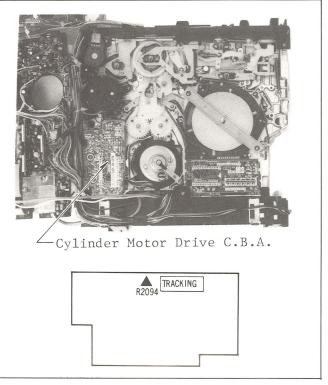


Fig. E7

# 2-3-1. 3.58MHz Crystal Oscillator Adjustment

Test Point: TP2006

Adjustment: C2033 (3.58 OSC)

- Don't supply any video signal to the video input on the right side panel. (Don't use the any Tuner unit)
- 2. Set the STOP mode.
- 3. Connect the scope to TP2006 on the servo section and set to DC Mode.
- 4. Confirm that the waveform as shown below.

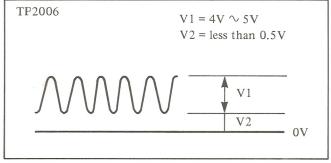


Fig. E8

- 5. Connect the frequency counter TP2006 on the same section.
- 6. Adjust the 3.58 OSC (C2033) so that the frequency is  $3.579545 \mathrm{MHz} \pm 10 \mathrm{Hz}$ .
- 7. Remove the frequency counter.

# 2-3-2. Head Switching Position Adjustment

Test Points: TP2003, TP3009 Adjustment: R2046 (PG SHIFT)

- 1. Connect the Multi-connector to the deck so that +12V is supplied to the deck.
- 2. Playback the color bar section of alignment tape.
- 3. Connect the scope CH1 to TP3009 on the Luminance section and CH2 to TP2003 on the servo section.
- 4. Set the scope to the CHOP mode.
- 5. Also set the scope to the Delay mode or expand the vertical interval of the signal from TP3009.
- 6. Adjust the PG SHIFT (R2046) so that the playback head switching point is  $6H \pm 1H$  before the start of vertical sync as shown below.

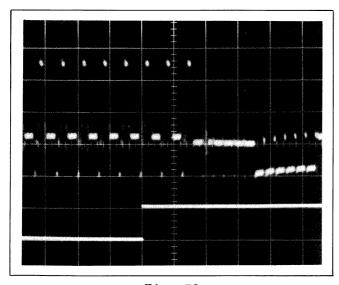


Fig. E9

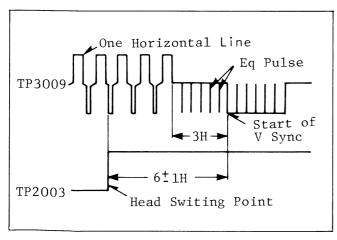


Fig. E10

7. Change the slope selector on the scope from "+" to "-" and make sure that the other switching point is also  $6H \pm 1H$  before the beginning of vertical sync.

#### 2-3-3. Tracking Control Adjustment

Test Points: TP2003, TP2005 Adjustment: R6524 (SUB-TRACKING)

- 1. Connect the Multi-connector to the deck and supply a video signal on the right side panel or tune in a local on-air TV program.
- 2. Set the tracking control on the right side panel to the center position.
- Insert a cassette and make a recording in the SP mode for a few minutes.
- 4. Playback the portion just recorded.
- 5. Connect the scope CH1 to TP2003 and CH2 to TP2005 on the servo section and expand sweep.
- 6. Adjust the SUB-TRACKING (R6524) on the jack panel section so that the T period becomes  $0.4 \pm 0.4$  msec.

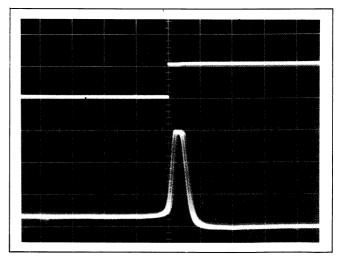


Fig. E11

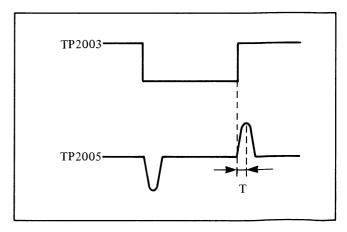


Fig. E12

#### 2-3-4. Insert Tracking Adjustment

Test Points: TP2003, TP2005

Adjustment: R2094 (INSERT TRACKING CONTROL)

- Connect the Multi-connector to the deck and supply a video signal on the right side panel or tune in a local on-air TV program.
- 2. Insert a cassette and make a recording in the SP mode for a few minutes.
- 3. Playback the portion just recorded.
- 4. Connect the scope CH1 to TP2003 and CH2 to TP2005 on the servo section.
- 5. Push the Pause/Still button.
- 6. Then push the RECORD button and simultaneously the Audio Dub button on the front panel.
- 7. Push the Pause/Still button again.
- 8. Adjust the TRACKING (R2094) on the CYLINDER DRIVE Board so that the "T" is  $0.4 \pm 0.4$  msec.

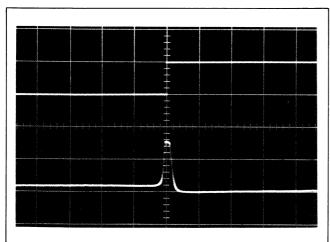


Fig. E13

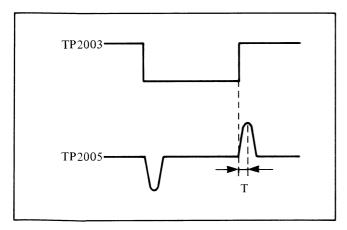


Fig. E14

# 2-3-5. Slow Servo Sampling Gate Adjustment

Test Point: TP2001

Adjustment: R2067 (FS FR)

- Connect the Multi-connector to the deck and supply a video signal on the right side panel or tune in a local on-air TV program.
- 2. Insert a cassette and make a recording in the SLP mode for a few minutes.
- 3. Playback the portion just recorded.
- 4. Push the slow button on the front panel
- 5. Disconnect P28, Slow Tracking Control from the P.C.B.
- 6. Connect the frequency counter to TP2001 on servo section.
- 7. Adjust the FS FR (R2067) so that the frequency is  $580 \text{Hz} \pm 10 \text{Hz}$ .
- 8. Remove the frequency counter.
- 9. Connect the connector (P28).

#### 2-3-6. Slow Brake Adjustment

Test Points: TP2008, TP2004 Adjustment: R2079 (FS B)

- Connect the Multi-connector to the deck and supply a video signal on the right side panel or tune in a local TV program.
- 2. Insert a cassette and make a recording in the SLP mode for a few minutes.
- 3. Playback the portion just recorded.
- 4. Activate slow mode.
- 5. Connect the scope CH1 to TP2008 and CH2 to TP2004 on the servo section. Set the scope to the CHOP mode.
- 6. Adjust the Fine Slow Brake (R2079) so that the V portion is as shown below.

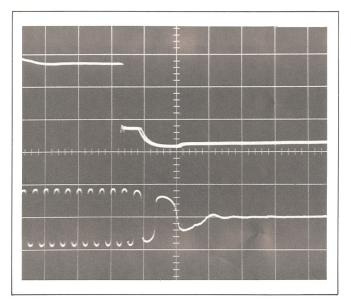


Fig. E15

7. In case of misadjustment, A-portion is as follows.

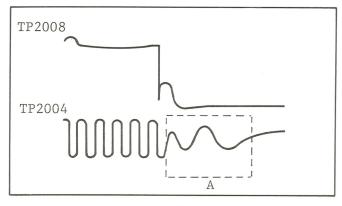


Fig. E16

#### 2-4. Audio Section

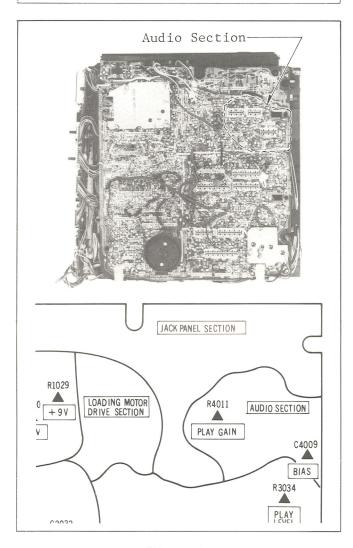


Fig. E17

#### 2-4-1. Bias Current Adjustment

Test Point: Audio Head Terminal Adjustment: C4009 (BIAS ADJ)

- Don't supply any Audio signal to the MIC IN JACK on the right side panel. (Don't use the any Tuner unit).
- 2. Insert a cassette and make a recording in the SP mode.
- 3. Connect the AC Millivolt Meter as shown Fig. E18.

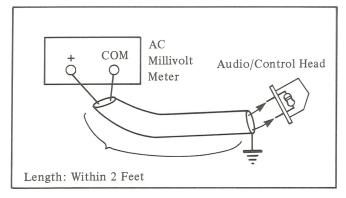


Fig. E18

4. Adjust the BIAS ADJ (C4009) so that the voltage is  $1.2 \pm 0.05 \text{mVrms}$ .

#### 2-4-2. Playback Gain Adjustment

Test Point: Audio Out Jack Adjustment: R4011 (P.B GAIN)

- 1. Supply a sinewave signal (1kHz and 5kHz -30dB 89mVp-p) to the MIC IN jack on the jack panel section. Using accessory of audio input attenuator as shown Fig. E19
- 2. Supply a video signal to the video input on the right side panel.

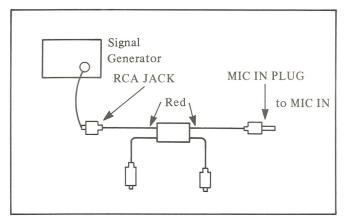


Fig. E19

- 3. Connect the DVM to audio out jack on the jack panel section.
- 4. Insert a cassette and make a recording 1kHz first then 5kHz signal in the SP mode, read the voltage of 1kHz.
- 5. Playback the portion just recorded.
- 6. Adjust the P.B GAIN (R4011) so that the voltage of 1kHz playback is equal to that of recording.
- 7. Confirm that the voltage of 5kHz and 1kHz are balanced.

#### 2-5. Video Section

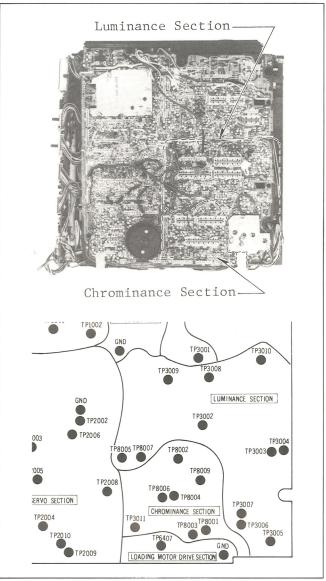


Fig. E20

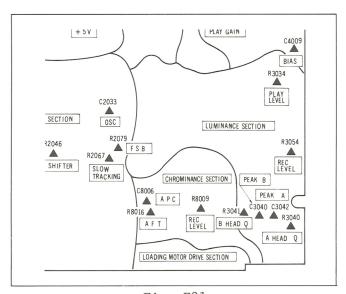


Fig. E21

# 2-5-1. Head Amp Peak Frequency Adjustment

Test Point: TP8001

Adjustments: C3040 (PEAK-B), C3042 (PEAK-A)

- A. Factory Adjustment
- Don't supply any video signal to the video input on the right side panel. (Don't use the any Tuner unit)
- 2. Turn controls as follows (all controls
   are on the Luminance section.)
   R3040 Fully clockwise
   (from foil side)
   R3041 Fully Counter Clockwise
   (from foil side)
- 3. Connect the sweep generator to TP3005 on the Luminance section. And put the marker on 4.5MHz.
- 4. Cover the supply and takeup photo transistors with two pieces of black paper and place the unit in the PLAY/PAUSE mode without a tape.
- 5. Connect the scope to TP8001 on the chrominance section.
- 6. Adjust the level of sweep generator to  $200 \pm 50 \text{mVp-p}$  at 4.5MHz on TP8001.
- 7. Adjust the PEAK-B (C3040) and the PEAK-A (C3042) so that the peaks on the scope are 4.5MHz  $\pm$  0.1MHz.

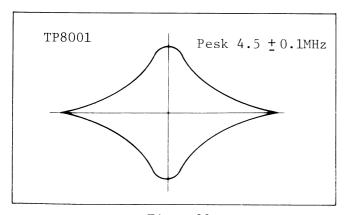


Fig. E22

#### B. Field Adjustment

- Don't supply any video signal to the video input on the right side panel. (Don't use the any tuner unit)
- 2. Turn controls as follows.
  R3040 Fully clockwise.
  (from foil side)
  R3041 Fully counter clockwise.
  (from foil side)
- 3. Connect the sinewave generator to TP3005 on the Luminance section.

- 4. Cover the supply and takeup photo transistors two pieces of black paper and place the unit in the PLAY/PAUSE mode without a tape.
- 5. Connect the scope to TP8001 on the chrominance section.
- 6. Adjust the PEAK-B (C3040) and the PEAK-A (C3042) so that the amplitude on the scope becomes maximum.

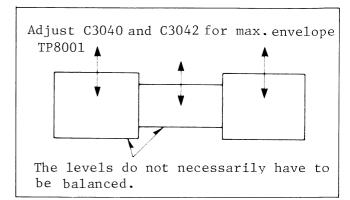


Fig. E23

# 2-5-2. Head Amp Frequency Response and Balance Adjustment

Test Point: TP3007

Adjustments: R3040 (Q-A), R3041 (Q-B)

A. Factory Adjustment

- 1. Supply the V sync from the sweep generator to the video input on the right side panel.
- 2. Connect a jumper between TP3003 and GND on the luminance section.
- 3. Connect the sweep generator to TP3004 on the same section.

  Put the marker on 2MHz, 3.4MHz and 4.5MHz
- 4. Connect the scope to TP3007 (HOT) and TP3006 (GND).
- Insert a cassette and make a recording in the SP mode for a few minutes.
- 6. Adjust the level of sweep generator to  $115\,\mathrm{mVp-p}$  at  $3.4\,\mathrm{MHz}$ .

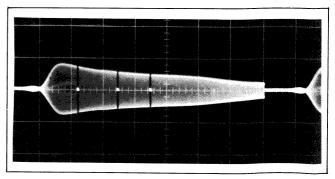


Fig. E24

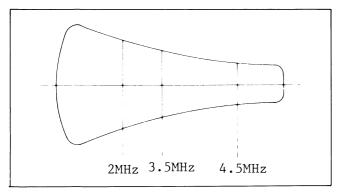


Fig. E25

- 7. Playback the portion just recorded.
- 8. Connect the scope to TP8001 on the chrominance section.
  Trigger the scope from TP3010.
- 9. Connect the jumper between TP3007 and  $\ensuremath{\mathsf{GND}}\xspace$
- 10. Expand the CH-B envelope.
- 11. Adjust the A HEAD Q (R3040) so that the levels at 2MHz and 4.5MHz are balanced.

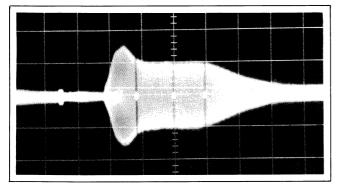


Fig. E26

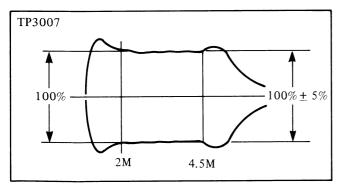


Fig. E27

- 12. Change the jumper from TP3007 to TP3005.
- 13. Expand the CH-A envelope.
- 14. Adjust the B HEAD Q (R3041) so that the levels at 2MHz and 4.5MHz are balanced.
- 15. Remove the jumper from TP3005 and TP3003.

- B. Field Adjustment
- 1. Connect the multi-connector to the deck and supply a video signal or tune in a local on-air TV program.
- 2. Connect a jumper between TP3003 and GND on the Luminance section.
- 3. Connect the sinewave generator to TP3004 on the same section.
- 4. Set the frequency of the sinewave generator to 3.4MHz.
- 5. Connect the scope between TP3007 (HOT) and TP3006 (GND).
- Insert a cassette, and make a recording in the SP mode for a few minutes.
- 7. Adjust the output level of the sinewave generator so that the peak-to-peak level on TP3007 is 115mVp-p.
- 8. Change the frequency of the sinewave generator from 3.4MHz to 2.0MHz and make a recording for about 10 seconds.
- 9. Then, change the frequency from 2.0MHz to 4.5MHz and make a recording for about 10 seconds.
- 10. Repeat about steps 8 and 9 for a couple of times.
- 11. Playback the portion just recorded.
- 12. Connect the scope to TP8001 on the chrominance section.
  Trigger the scope from TP3010.
- 13. Connect the jumper between TP3007 and  $\ensuremath{\mathsf{GND}}$ .
- 14. Adjust the A HEAD Q (R3040) so that the levels at 2MHz and 4.5MHz are balanced.
- 15. Change the jumper from TP3007 to TP3005.
- 16. Adjust the B HEAD Q (R3041) so that the levels at 2MHz and 4.5MHz are balanced.
- 17. Remove the jumper from TP3005 and TP3003.

#### 2-5-3. Recording Current Adjustment

Test Point: TP3007

Adjustments: R3054 (REC CURR), R8009 (REC

CHROMA)

- 1. Connect the Multi-connector to the deck and supply a video signal or tune in a local on-air TV program.
- 2. Insert a cassette and make a recording in the SP mode.
- 3. Connect the scope to TP3007 (HOT) and TP3006 (GND) on the luminance section.
- 4. Turn the REC CURR (R3054) to fully clockwise from foil side.
- 5. Adjust the REC CHROMA (R8009) on the chrominance section so that the level of syan portion is  $28 \pm 3 \text{mVp-p}$ .

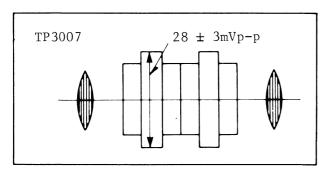


Fig. E28

6. Then slowly turn the REC CURR (R3054) on the luminance section so that V sync portion of the envelope at TP3007 is  $115 \pm 3 \text{mVp-p}$ .

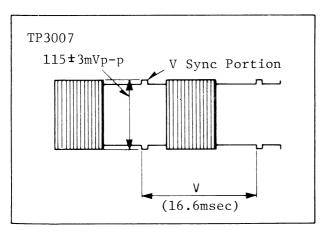


Fig. E29

#### 2-5-4. Playback Level Adjustment

Test Point: TP3009

Adjustment: R3034 (P.B LEVEL)

- 1. Supply a color bar signal to the right side panel.
- 2. Insert a cassette and make a recording in the SP mode for a few minutes.
- 3. Connect the scope to TP3009 on the luminance section.
- 4. Playback the portion just recorded.
- 5. During playback, adjust the P.B LEVEL (R3034) so that the video level is 2.0 ± 0.1Vp-p.
- 6. Confirm that the chroma level is  $1.2 \pm 0.2$ Vp-p.

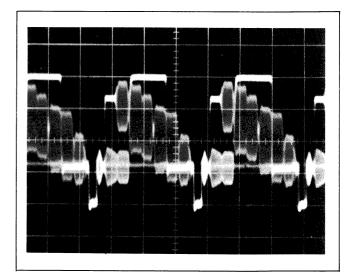


Fig. E30

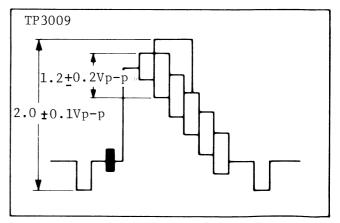


Fig. E31

#### 2-5-4. APC 3.58MHz VXO Adjustment

Test Point: TP8007 Adjustment: R8006 (APC)

- Connect teh Multi-connector to the deck and supply a video signal or tune in a local on-air TV program.
- Connect a jumper between TP8003 and GND.
- 3. Connect a  $18k\Omega$  resistor between TP8006 and GND.
- 4. Connect a  $39 k\Omega$  resistor between TP8004 and GND.
- 5. Place the unit in STOP mode.
- 6. Connect the frequency counter to TP8007.
- 7. Adjust the APC (R8006) on the chrominance section so that the frequency is  $3.979545 \pm 10$ Hz.
- 8. Remove the Frequency counter.

#### 2-5-6. AFC Adjustment

Test Point: TP8005

Adjustment: R8016 (AFC/AFT)

- Don't supply any video signal to the video input on the right side panel. (Don't use the any Tuner unit.)
- 2. Connect a frequency counter to TP8005 on the Chrominance section.
- Insert a cassette and make a recording.
- 4. Adjust the AFC/AFT (R8016) on the chrominance section so that the frequency is 15.734kHz  $\pm$  200Hz.
- 5. Remove the frequency counter.

#### 2-6. WIRED REMOTE CONTROL UNIT SECTION

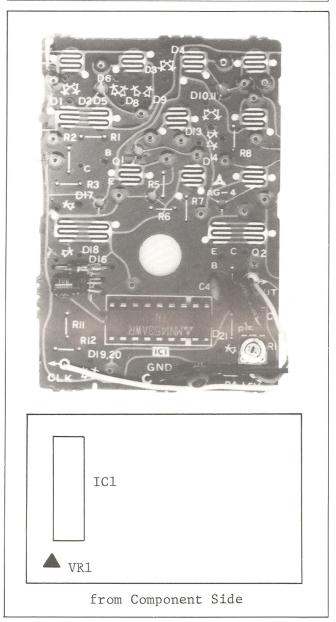


Fig. E32

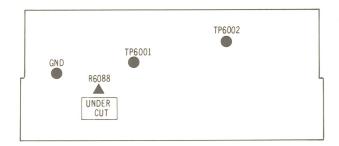
# 2-6-1. MICROPROCESSOR CLOCK FREQUENCY ADJUSTMENT

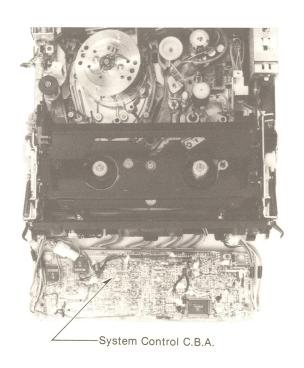
- 1. Connect the WIRED REMOTE CONTROL UNIT to the deck.
- 2. Connect the frequency counter to PIN18 of IC1.
- 3. Adjust the VRl so the frequency is  $25 \text{KHz} \pm 0.2 \text{KHz}$ .

### **LOCATION OF TEST POINT & CONTROLS**

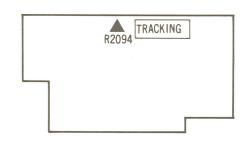
#### MAIN C.B.A. (VEPS0317A) JACK PANEL SECTION A.V.R. SECTION AUDIO SECTION TP1001 TP2001 LUMINANCE SECTION TP3002 TP2002 A.V.R Section Audio Section TP3004 TP3003 TP8009 TP2008 SERVO SECTION NANCE SECTION TP2004 LOADING MOTOR DRIVE SECTION R6524 TRACKING JACK PANEL SECTION SUB-TRACKNG A.V.R. SECTION R1030 + 9V LOADING MOTOR DRIVE SECTION AUDIO SECTION Servo Section PLAY GAIN Chrominance Section R3034 Luminance Section -C2033 **▲** 0SC SERVO SECTION LUMINANCE SECTION R2046 R3054 R2067 PG SHIFTER C8006 PEAK A R8009 REC LEVEL AFT B HEAD Q A HEAD Q LOADING MOTOR DRIVE SECTION

### SYSTEM CONTROL C.B.A. (VEPS0648A)





### CYLINDER MOTOR DRIVE C.B.A. (VEPS0227A)





# Service Manua

Vol. 3

**Block Diagrams** 

Panasonic VHS Omnivision

Portable Video Cassette Recorder



#### **SPECIFICATIONS**

Power Source: 12 VDC

> Battery LCS-2012P Elec. Tuner Unit PV-A200 Prog. Tuner Unit PV-A500 Multiple AC Adaptor PV-A100 Plug-in AC Adaptor PV-A110 Approx. 7W at Play mode

Power Consumption: Television System: EIA Standard (525 lines, 60 fields)

NTSC color signal

Video Recording

Heads:

System: 2 rotary heads helical scanning system

Luminance: FM azimuth recording Chrominance: Converted subcarrier phase shift recording

Audio Track: 1 track

Tape Format: Tape width 1/2" (12.7 mm), high density

Tape Speed: SP mode: 1-5/16 i.p.s (33.35 mm/s)

> LP mode: 21/32 i.p.s (16.67 mm/s) SLP mode: 7/16 i.p.s (11.12 mm/s)

Record/Playback Time: 360 min. with NV-T120 used in SLP

mode

FF/REW Time: Less than 6 min. with NV-T120

Video: 2 Rotary heads

Audio/Control: 1 stationary head

Erase: 1 full track erase

1 audio track erase for audio

dubbing

Input Level: Video: VIDEO IN Jack (RCA type)

 $1.0\,\mathrm{Vp}$ -p,  $75\Omega$  unbalanced

Audio: MIC IN Jack

 $-70\,dB$ ,  $600\Omega$  unbalanced

Video: VIDEO OUT Jack (RCA type) Output Level:

 $1.0\,\mathrm{Vp}$ -p,  $75\Omega$  unbalanced

Audio: AUDIO OUT Jack (RCA type)

-6dB, 600Ω unbalanced

RF Modulated: Ch3/Ch4 switchable,

 $72 dB\mu$  (open voltage),  $75\Omega$  unbalanced

Video Horizontal

Resolution: More than 230 lines

Audio Frequency

Response: SP: 100 Hz~8kHz,  $(10 dB down) LP: 100 Hz \sim 6 kHz,$ 

SLP:  $150 \,\mathrm{Hz} \sim 5 \,\mathrm{kHz}$ 

Signal-to-Noise Ratio: Video: SP mode: better than 40 dB

LP mode: better than 40dB SLP mode: better than 40dB (Rohde & Schwarz noise meter) Audio: SP mode: better than 42dB

LP mode: better than 40dB SLP mode: better than 40dB

Operating

Temperature:  $32^{\circ}F \sim 104^{\circ}F$  ( $0^{\circ}C \sim 40^{\circ}C$ )

Operating Humidity:  $10\% \sim 75\%$ 

8.4 lbs (3.8kg) (with internal battery pack) Weight:

Dimensions:  $9-3/8 \text{ "(W)} \times 3-5/8 \text{ "(H)} \times 9-9/16 \text{ "(D)}$ 

 $238(W) \times 92.5(H) \times 242(D) mm$ 

Weight and dimensions shown are approximate. Specifications are subject to change without notice.

# **Panasonic**

Panasonic Company Division of Matsushita Electric Corporation of America One Panasonic Way, Secaucus, New Jersey 07094

91-238 Kauhi St. Ewa Beach Honolulu, Hawaii 96808-0774

Panasonic Canada Division of Matsushita Electric of Canada Limited

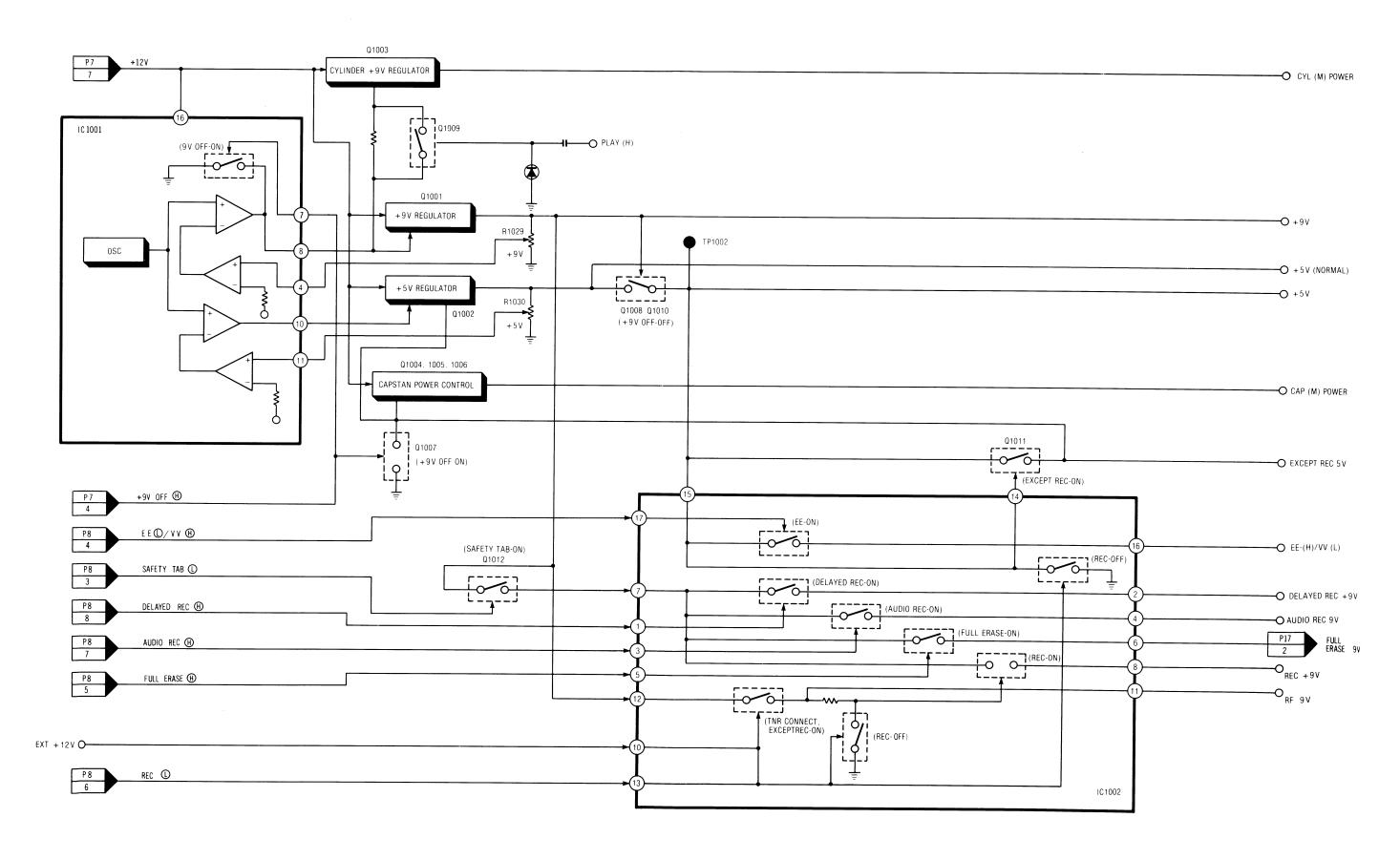
5770 Ambler Drive, Mississauga, Ontario, L4W 2T3

Panasonic Sales Company, Division of Matsushita Electric of Puerto Rico, Inc. Ave, 65 De Infanteria, KM 9.7 Victoria Industrial Park Carolina, Puerto Rico 00630

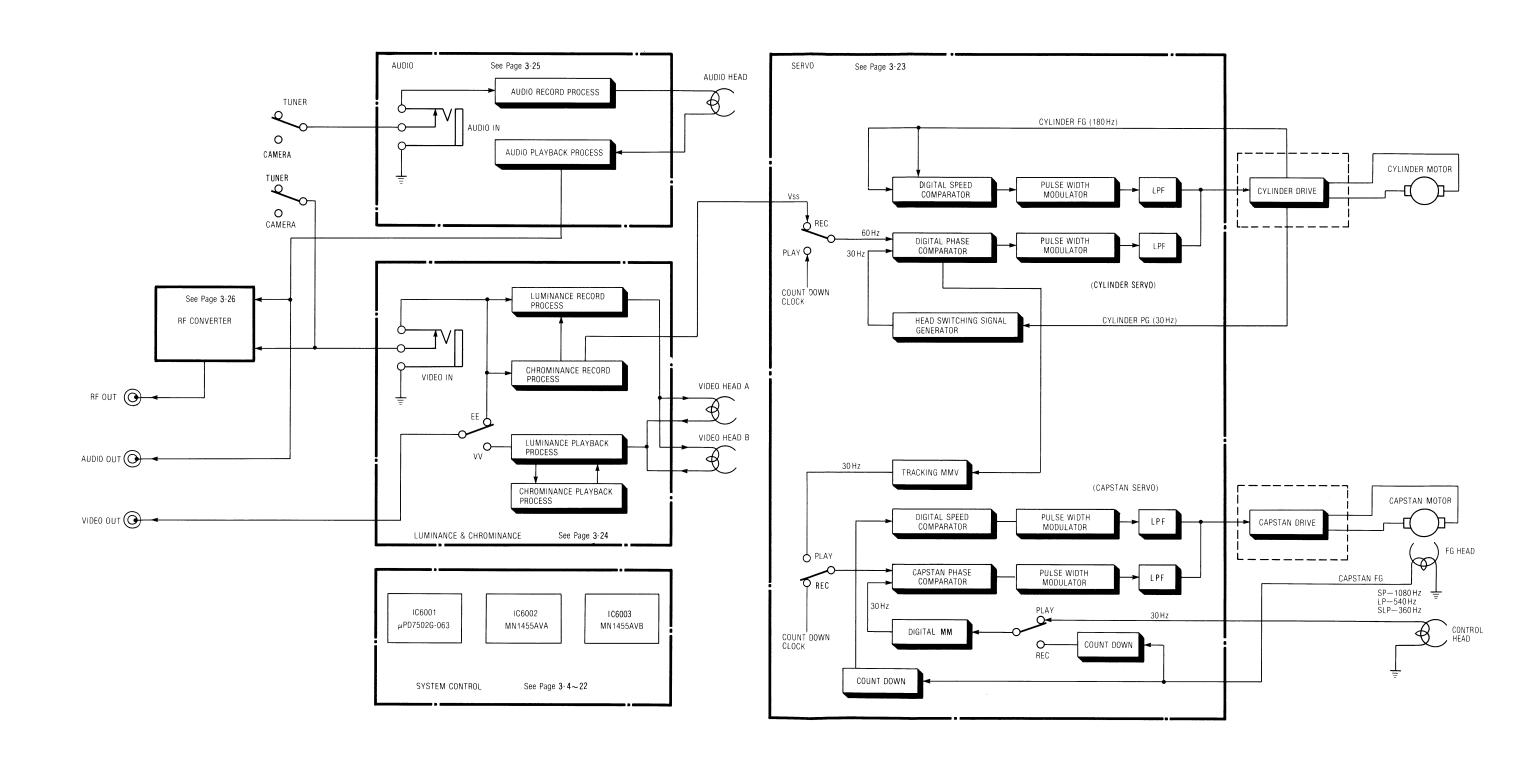
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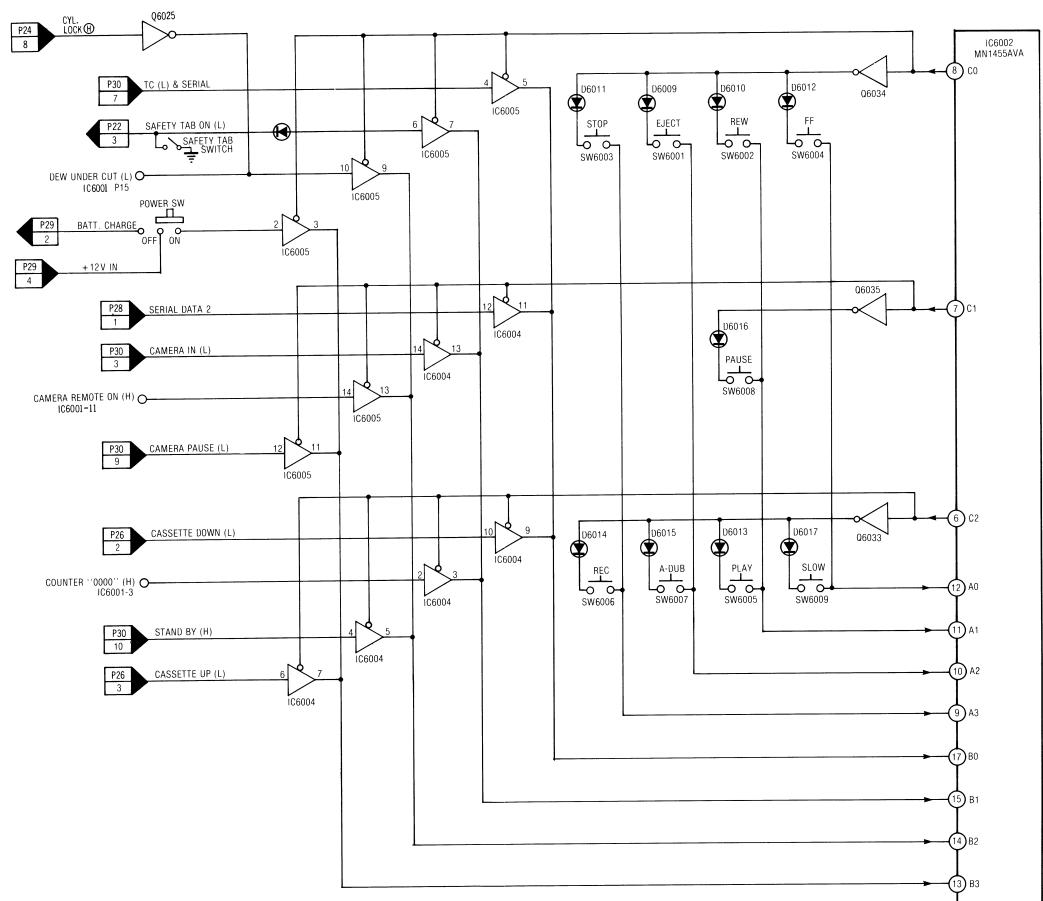
### A.V.R CIRCUIT BLOCK DIAGRAM



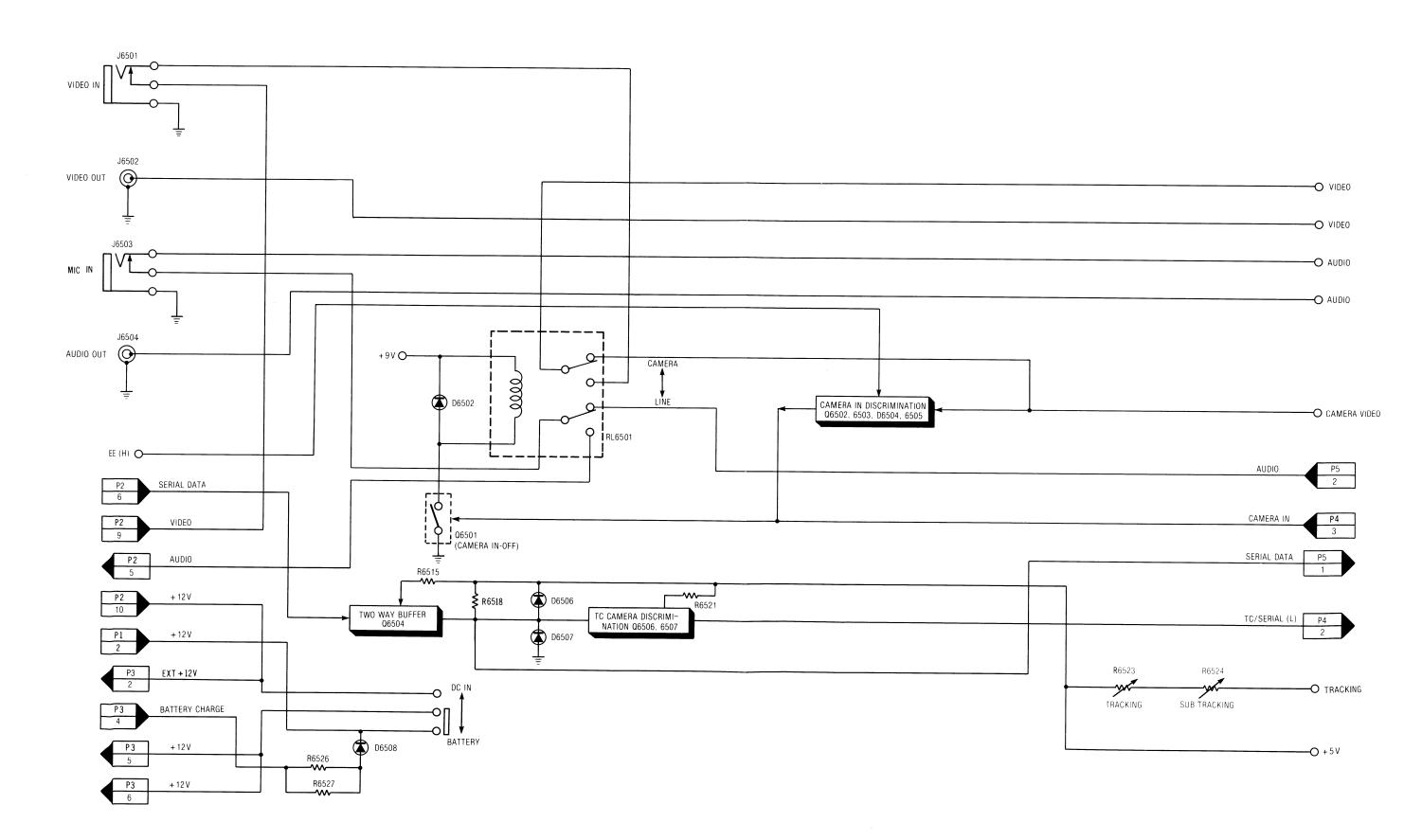
### **OVERALL BLOCK DIAGRAM**



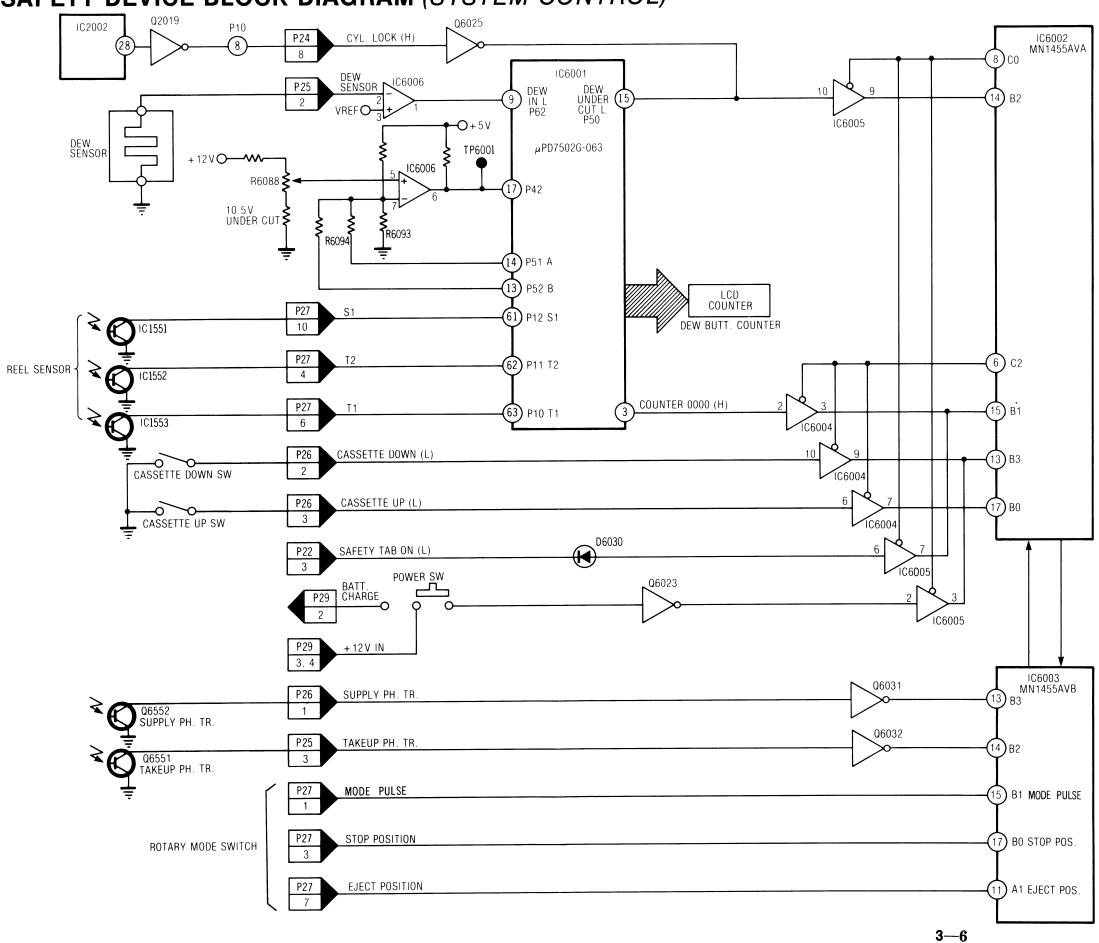
# KEY MATRIX BLOCK DIAGRAM (SYSTEM CONTROL)



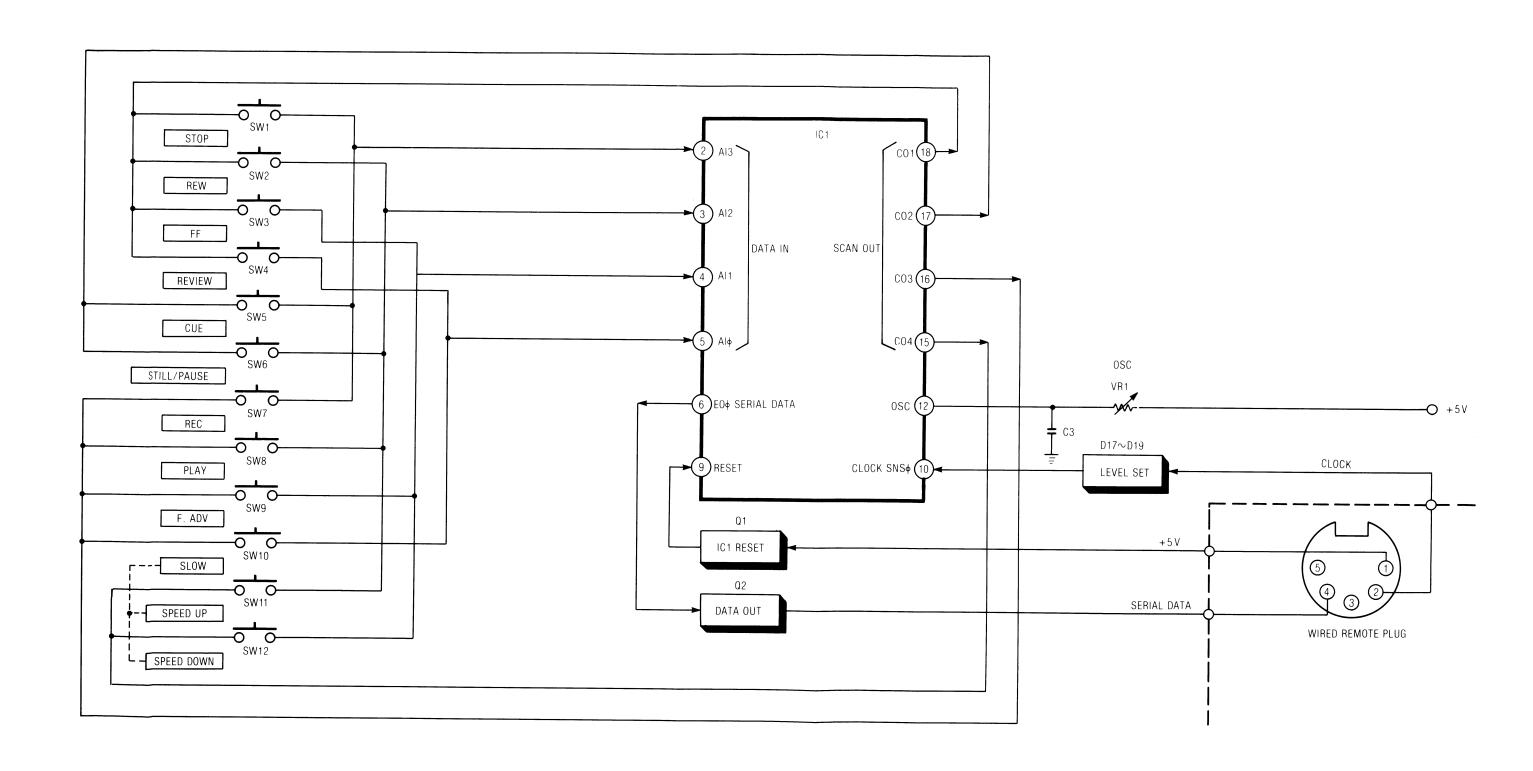
## **JACK PANEL BLOCK DIAGRAM**



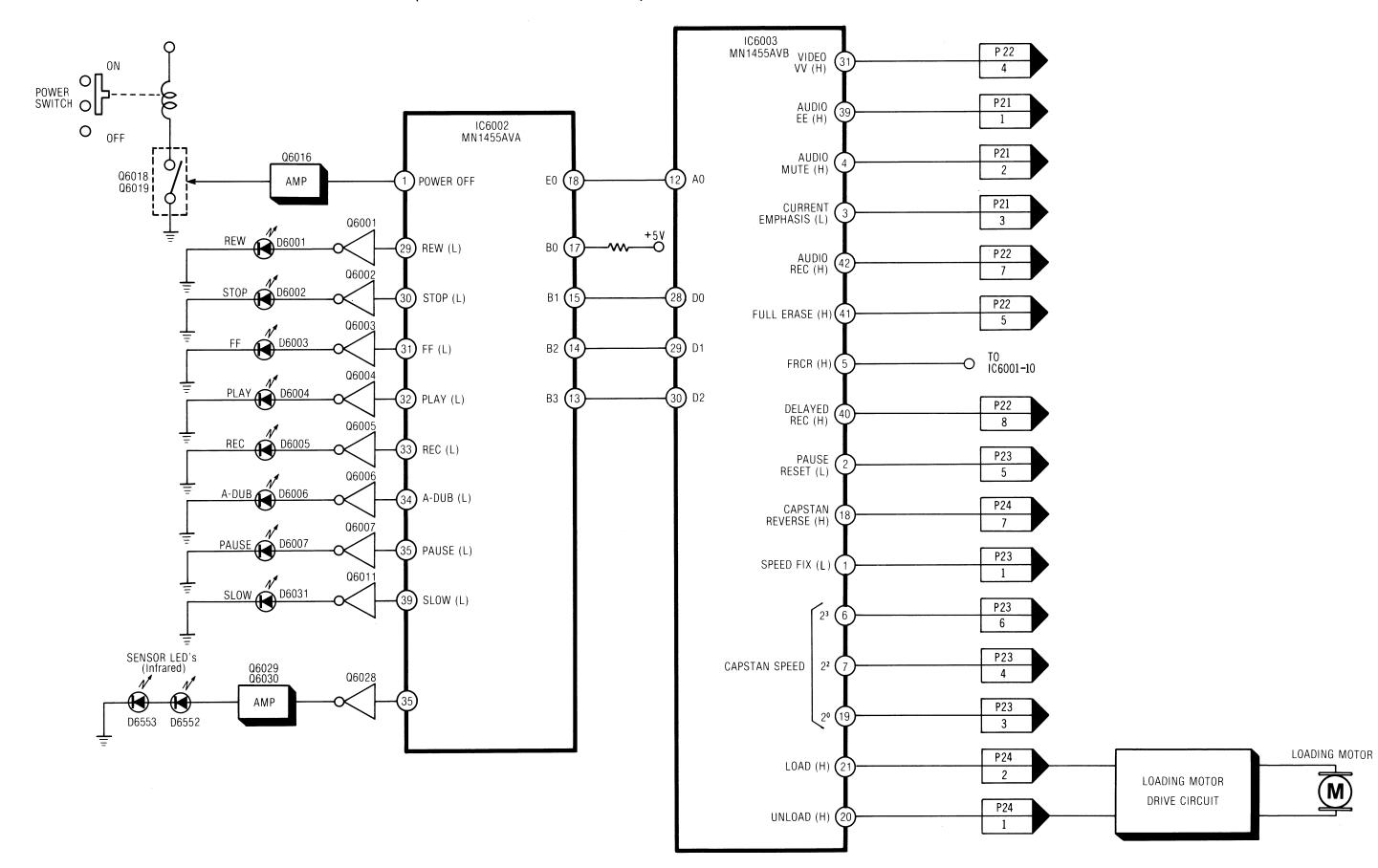
# SAFETY DEVICE BLOCK DIAGRAM (SYSTEM CONTROL)



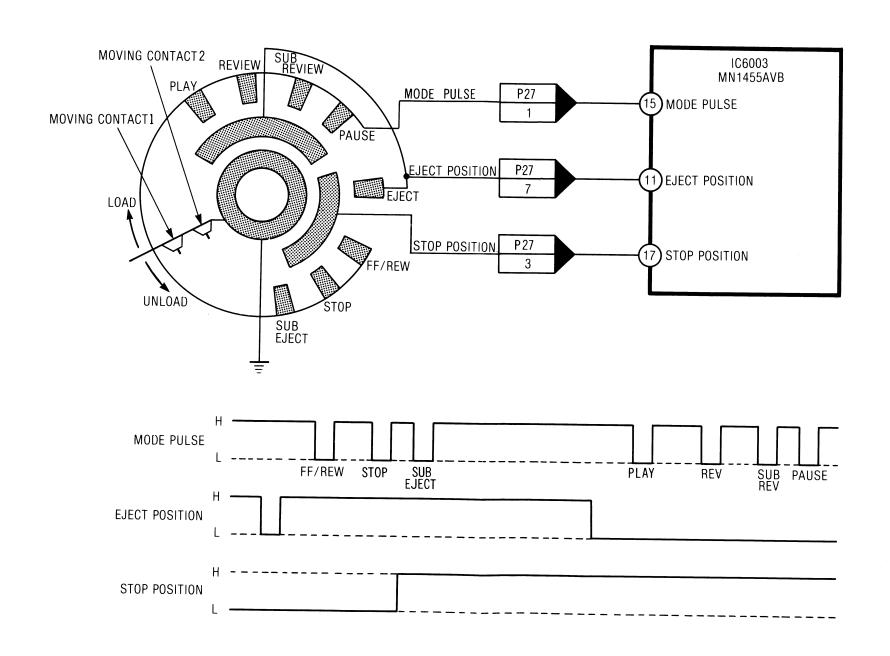
### WIRED REMOTE CONTROL BLOCK DIAGRAM



### **DRIVE SIGNAL BLOCK DIAGRAM (SYSTEM CONTROL)**



# MODE SELECT SWITCH BLOCK DIAGRAM (SYSTEM CONTROL)



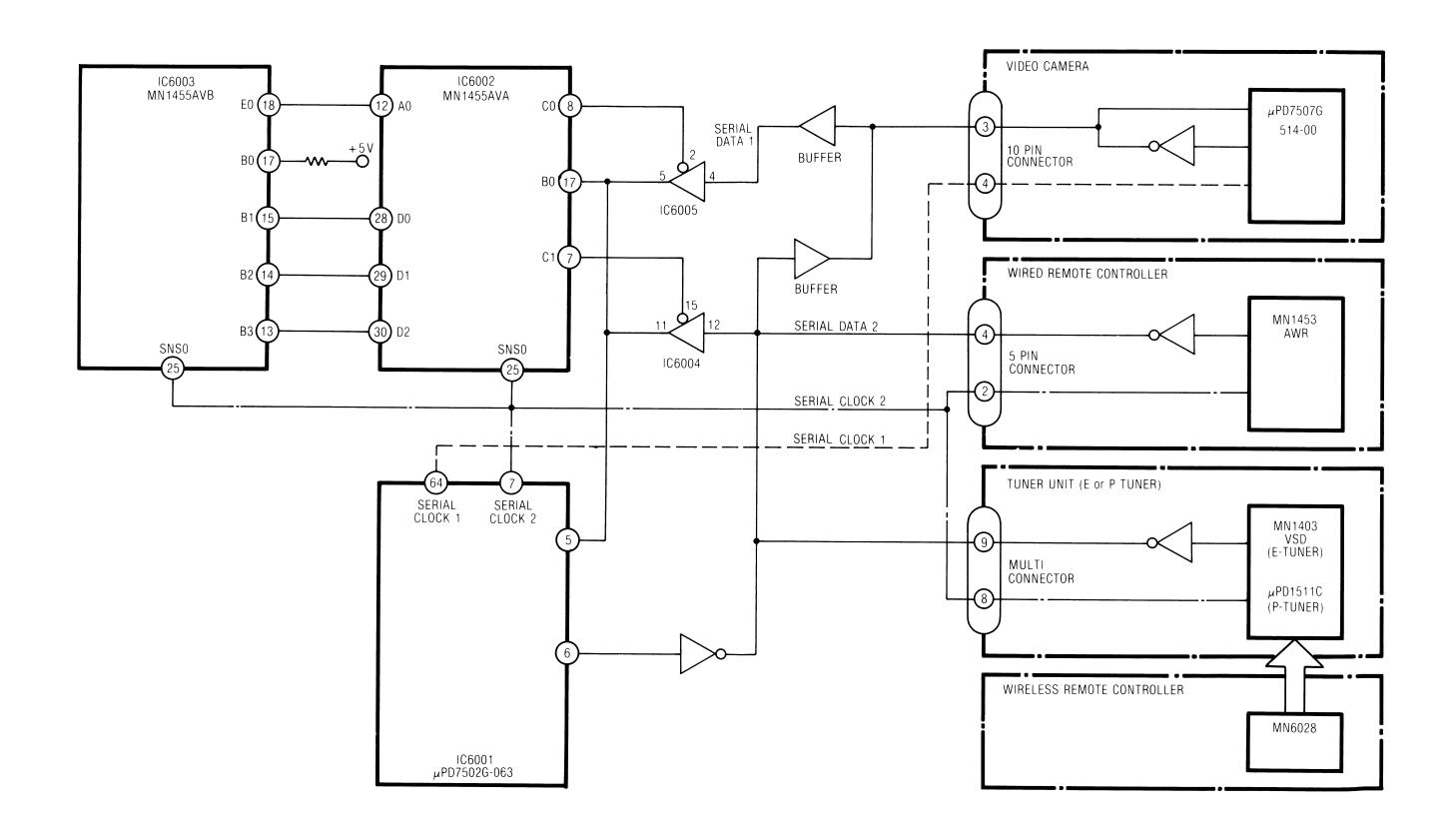
# μ**PD7502G-063 I/O**

PIN	NAME	I/O	OPERATION
1	_	_	-
2	P32	ОИТРИТ	REEL LOCK
3	P31	OUTPUT	COWNTOR 0000: (H)
4	P30	ОИТРИТ	SERIAL CLOCK 2
5	P03	INPUT	SERIAL DATA IN
6	P02	OUTPUT	SERIAL DATA OUT
7	P01	ОИТРИТ	SERIAL CLOCK 2
8	P63	ОИТРИТ	LCD OFF
9	P62	INPUT	DEW IN (L)
10	P61	INPUT	FRCR (FF/REW/CUE/REV) IN
11	P60	INPUT	CAMERA REMOTE ON (H)
12	P53	ОИТРИТ	REEL SENSOR LED ON
13	P52	ОИТРИТ	BATTERY CHECK A
14	P51	OUTPUT	BATTERY CHECK B
15	P50	OUTPUT	AUTO STOP (L)
16	P43	INPUT	TALLY IN
17	P42	INPUT	BATTERY CHECK
18	P41	INPUT	COUNTER OR MEMORY SW
19	P40	INPUT	COUNTER CLEAR
20	X2	_	_
21	X1	INPUT	GND
22	Vss	INPUT	GND
23	VLC3	INPUT	+ 2 V
24	VLC2	INPUT	+ 3 V
25	VLC1	INPUT	+ 4 V
26	VDD	INPUT	+ 5 V
27	СОМЗ	_	_
28	COM2	OUTPUT	LCD DRIVE
29	COM1	OUTPUT	LCD DRIVE
30	COM0	OUTPUT	LCD DRIVE
31	S23	_	<del>-</del>
32	S22	-	<del>-</del>
33	S21	-	_

PIN	NAME	I/O	OPERATION
34	S20	_	_
35	S19	_	_
36	S18	_	<del>_</del>
37	S17	_	_
38	S16	_	_
39	S15	_	<del>_</del>
40	S14	_	_
41	S13	_	_
42	S12	OUTPUT	LCD DRIVE
43	S11	OUTPUT	LCD DRIVE
44	S10	OUTPUT	LCD DRIVE
45	S9	OUTPUT	LCD DRIVE
46	S8	OUTPUT	LCD DRIVE
47	S7	OUTPUT	LCD DRIVE
48	S6	OUTPUT	LCD DRIVE
49	S5	OUTPUT	LCD DRIVE
50	S4	OUTPUT	LCD DRIVE
51	S3	OUTPUT	LCD DRIVE
52	S2	OUTPUT	LCD DRIVE
53	S1	OUTPUT	LCD DRIVE
54	S0	OUTPUT	LCD DRIVE
55	INT1	_	GND
56	RESET	INPUT	RESET (H)
57	CL1	INPUT	REF 180kHz
58	VDD	INPUT	+ 5 V
59	CL2		_
60	P13	INPUT	POWER OFF
61	P12	INPUT	REEL SENSOR S1
62	P11	INPUT	REEL SENSOR T2
63	P10	INPUT	REEL SENSOR T1
64	P33	INPUT	SERIAL CLOCK 1

3—10

# SERIAL DATA TRANSMISSION BLOCK DIAGRAM (SYSTEM CONTROL)

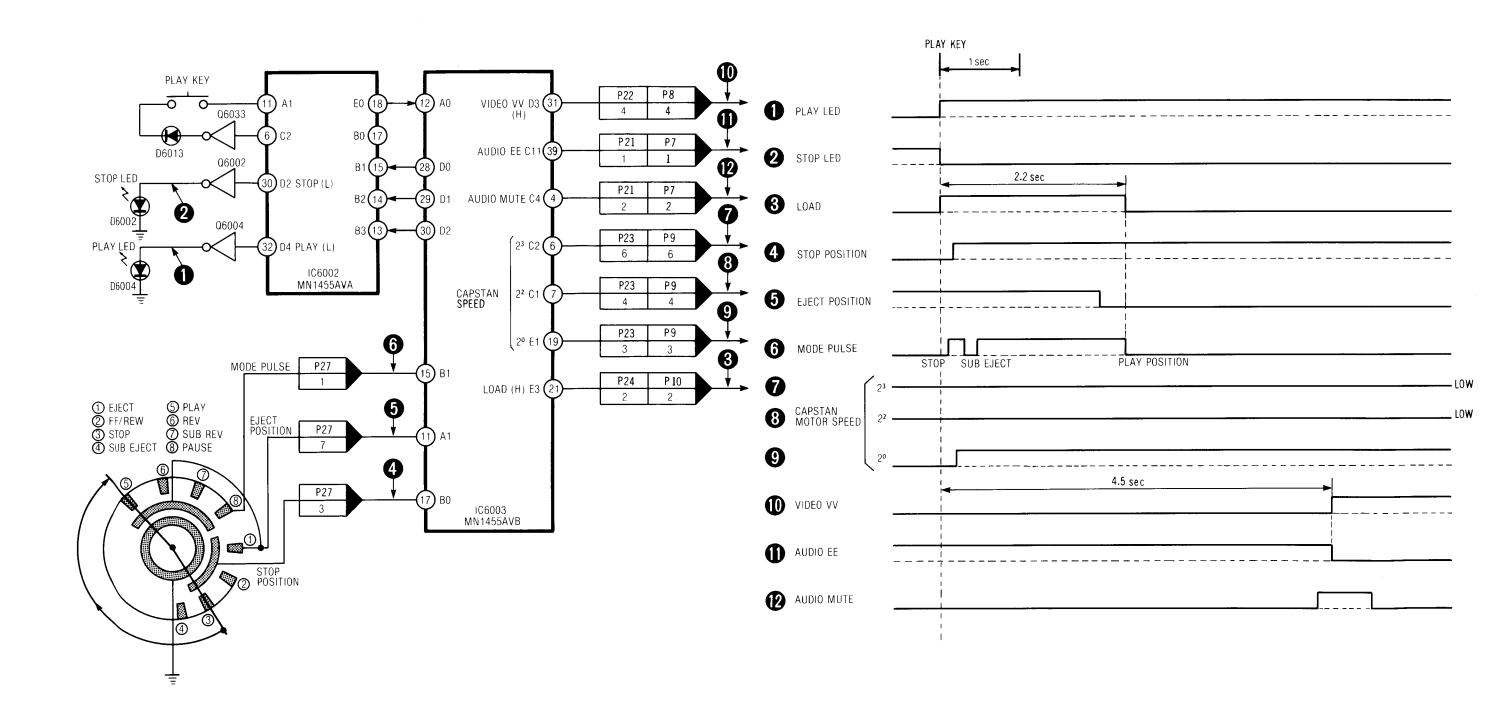


### **MN1455AVA I/O**

PIN	NAME	I/O		OPERATION
1	C7	OUTPUT	POWER SW OF	FF (H)
2	C6	_	_	
3	C5	OUTPUT	PRE POWER O	PFF (H)
4	C4	_	_	
5	C3	_	_	
6	C2	OUTPUT	C2 SCAN PULS	SE
7	C1	OUTPUT	C1 SCAN PULS	SE
8	C0	OUTPUT	C0 SCAN PULS	SE
9	А3	INPUT	SCAN PULSE	OPERATION
			C0	STOP KEY
			C2	REC KEY
10	A2	INPUT	SCAN PULSE	OPERATION
		1	C0	EJECT KEY
	:		C2	A. DUB KEY
11	A1	INPUT	SCAN PULSE	OPERATION
			CO	REW KEY
			C1	PAUSE KEY
			C2	PLAY KEY
12	A0	INPUT	SCAN PULSE	OPERATION
			C0	FF KEY
			C2	SLOW KEY
13	В3	INPUT	SCAN PULSE	OPERATION
		la l	C0	POWER ON
			C1	CAMERA PAUSE
			C2	CASSETTE UP
			C3	ECHO FROM IC6003
14	B2	INPUT	SCAN PULSE	OPERATION
			C0	DEW DETECT
			C1	CAMERA REMOTE ON
			C2	CAMERA STANDBY
			C3	ECHO FROM IC6003

PIN	NAME	I/O		OPERATION
15	B1	INPUT	SCAN PULSE	OPERATION
			C0	SAFETY TAB
			C1	CAMERA IN
			C2	COUNTER ZERO
			C3	ECHO FROM IC6003
16	_	_	_	
17	В0	INPUT	SCAN PULSE	OPERATION
	•		C0	SERIAL DATA 2
			C1	SERIAL CODE
			C2	CASSETTE UP
18	E0	OUTPUT	MODE INFORM	IATION TO IC6003
19	E1	_		
20	E2	_	_	
21	E3	OUTPUT	SERIAL DATA 1	
22	TST	_	GND	
23	RST	INPUT	RESET (L)	
24	CSLT	INPUT	+5V	
25	SNS0	INPUT	SERIAL CLOCK	3.2
26	SNS1	INPUT	AUTO STOP FR	ROM IC6001
27	_	_	_	
28	D0	OUTPUT	9V OFF (H)	
29	D1	OUTPUT	REW (L)	
30	D2	OUTPUT	STOP (L)	
31	D3	OUTPUT	FF (L)	
32	D4	OUTPUT	PLAY (L)	
33	D5	OUTPUT	REC (L)	
34	D6	OUTPUT	A. DUB (L)	
35	D7	OUTPUT	PAUSE (L)	
36	VDD	INPUT	+5V	
37	osc	INPUT	OSCILLATOR R	EF 900kHz

# **STOP** → **PLAY BLOCK DIAGRAM** (SYSTEM CONTROL)



PIN	NAME	1/0	OPERATION
38	Vss	INPUT	GND
39	C11	OUTPUT	SLOW (L)
40	C10	OUTPUT	F. ADV/SLOW (H)
41	C9	OUTPUT	TALLY OUT
42	C8	_	_

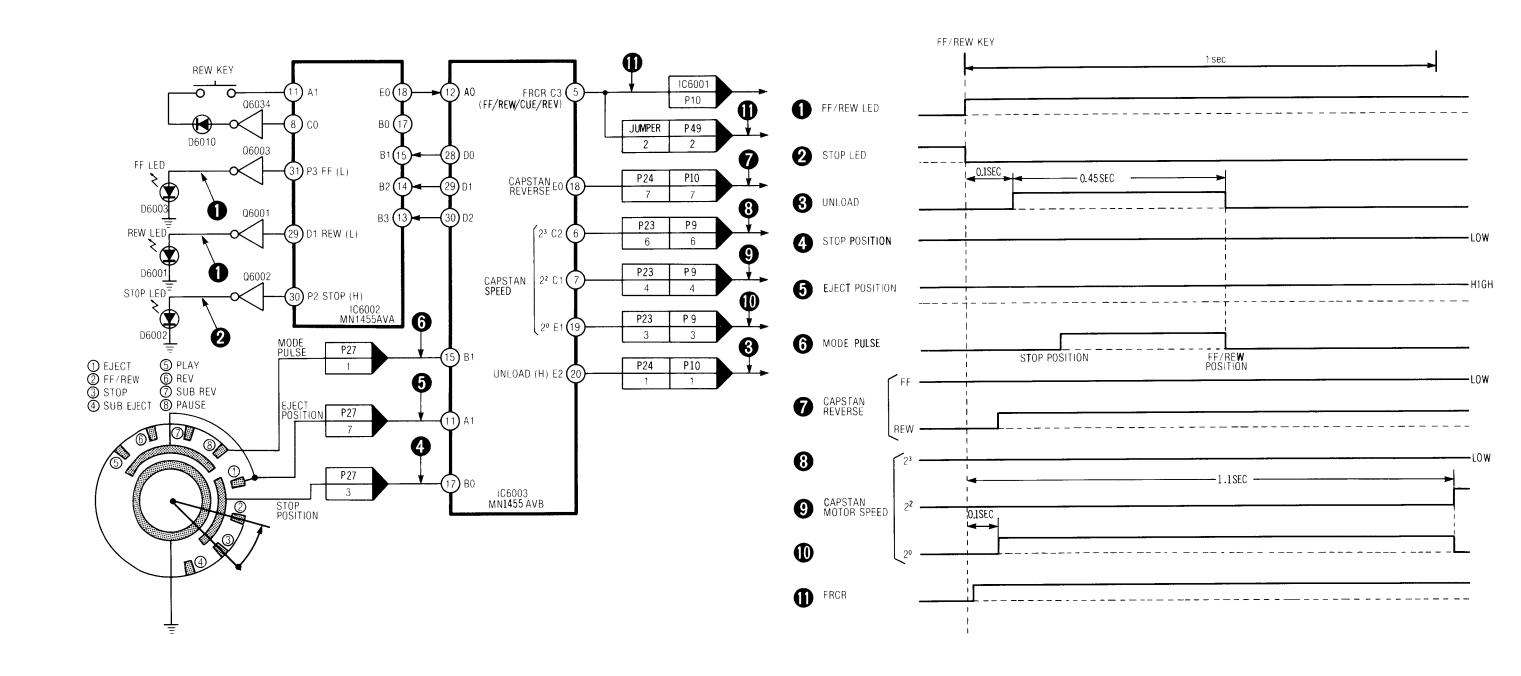
# **MN1455AVB I/O**

PIN	NAME	I/O	OPERATION
1	C7	OUTPUT	SPEED FIX (L)
2	C6	OUTPUT	PAUSE RESET (L)
3	C5	OUTPUT	CURRENT EMPHASIS (L)
4	C4	OUTPUT	AUDIO MUTE (H)
5	С3	OUTPUT	FRCR (FF/REW/CUE/REV) (H)
6	C2	OUTPUT	CAPSTAN SPEED 2 <sup>3</sup>
7	C1	OUTPUT	CAPSTAN SPEED 2 <sup>2</sup>
8	C0	_	_
9	A3	_	GND
10	A2	INPUT	6H (H)
11	A1	INPUT	EJECT POSITION (L)
12	A0	INPUT	SERIAL DATA 2
13	B3	INPUT	SUPPLY PHOTO TR ON DETECT
14	B2	INPUT	TAKEUP PHOTO TR ON DETECT
15	B1	INPUT	MODE PULSE
16	_	_	_
17	В0	INPUT	STOP POSITION (L)
18	E0	OUTPUT	CAP REVERSE (H)
19	E1	OUTPUT	CAPSTAN SPEED 2º
20	E2	OUTPUT	UNLOADING (H)
21	E3	OUTPUT	LOADING (H)
22	TST	-	GND
23	RST	INPUT	RESET (L)
24	CSLT	INPUT	+ 5 V

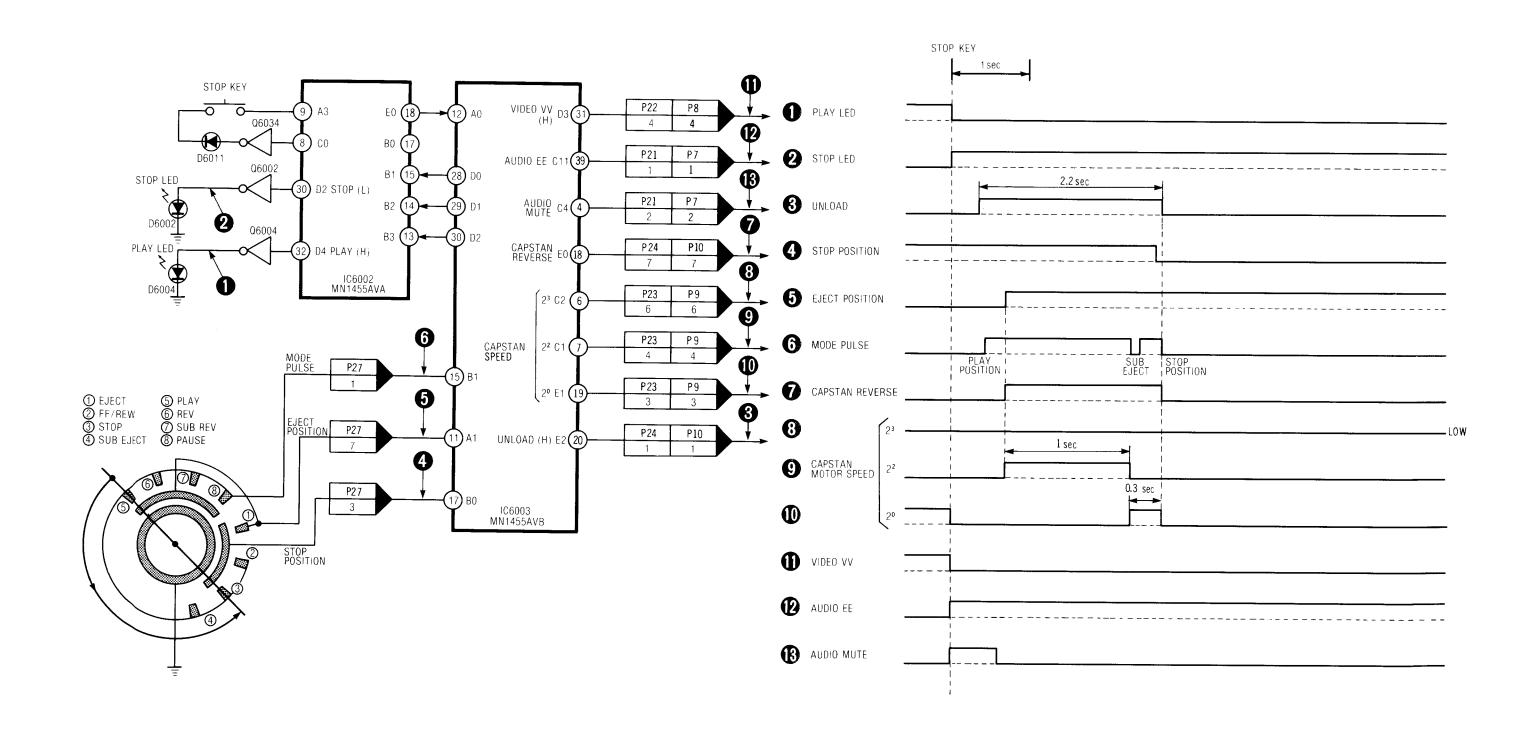
3—13

PIN	NAME	I/O	OPERATION
25	SNS0	INPUT	SERIAL CLOCK 2
26	SNS1		+5V
27	_	_	_
28	D0	OUTPUT	ECHO TO IC6002
29	D1	OUTPUT	ECHO TO IC6002
30	D2	OUTPUT	ECHO TO IC6002
31	D3	OUTPUT	EE (L)
32	D4	_	_
33	D5	_	<u> </u>
34	D6	_	_
35	D7	ОИТРИТ	TAPE SENSOR LED
36	VDD	_	+5V
37	osc	INPUT	REF 900kHz
38	Vss	INPUT	GND
39	C11	ОИТРИТ	AUDIO EE
40	C10	ОИТРИТ	DELAYED REC
41	C9	ОИТРИТ	FULL ERASE
42	C8	OUTPUT	AUDIO REC

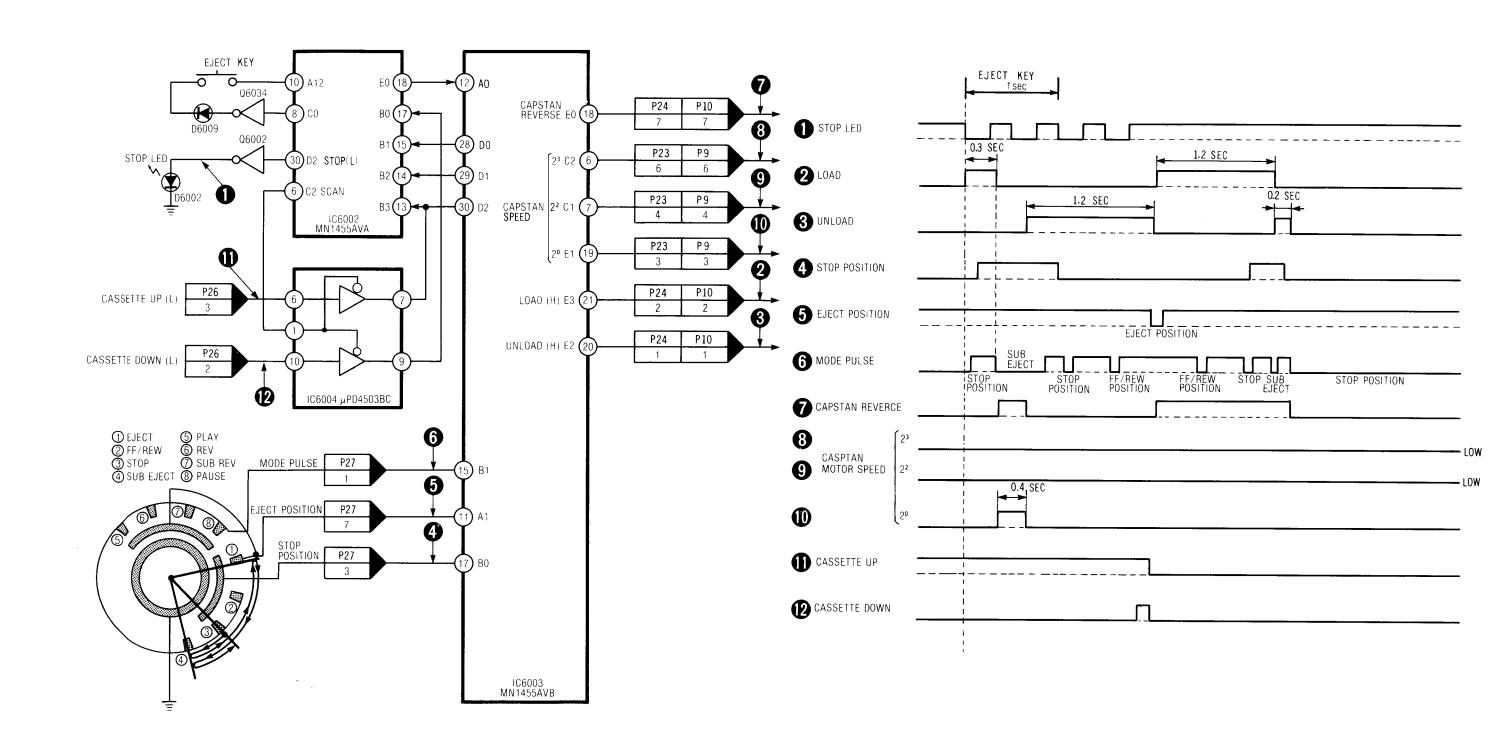
## STOP → FF/REW BLOCK DIAGRAM (SYSTEM CONTROL)



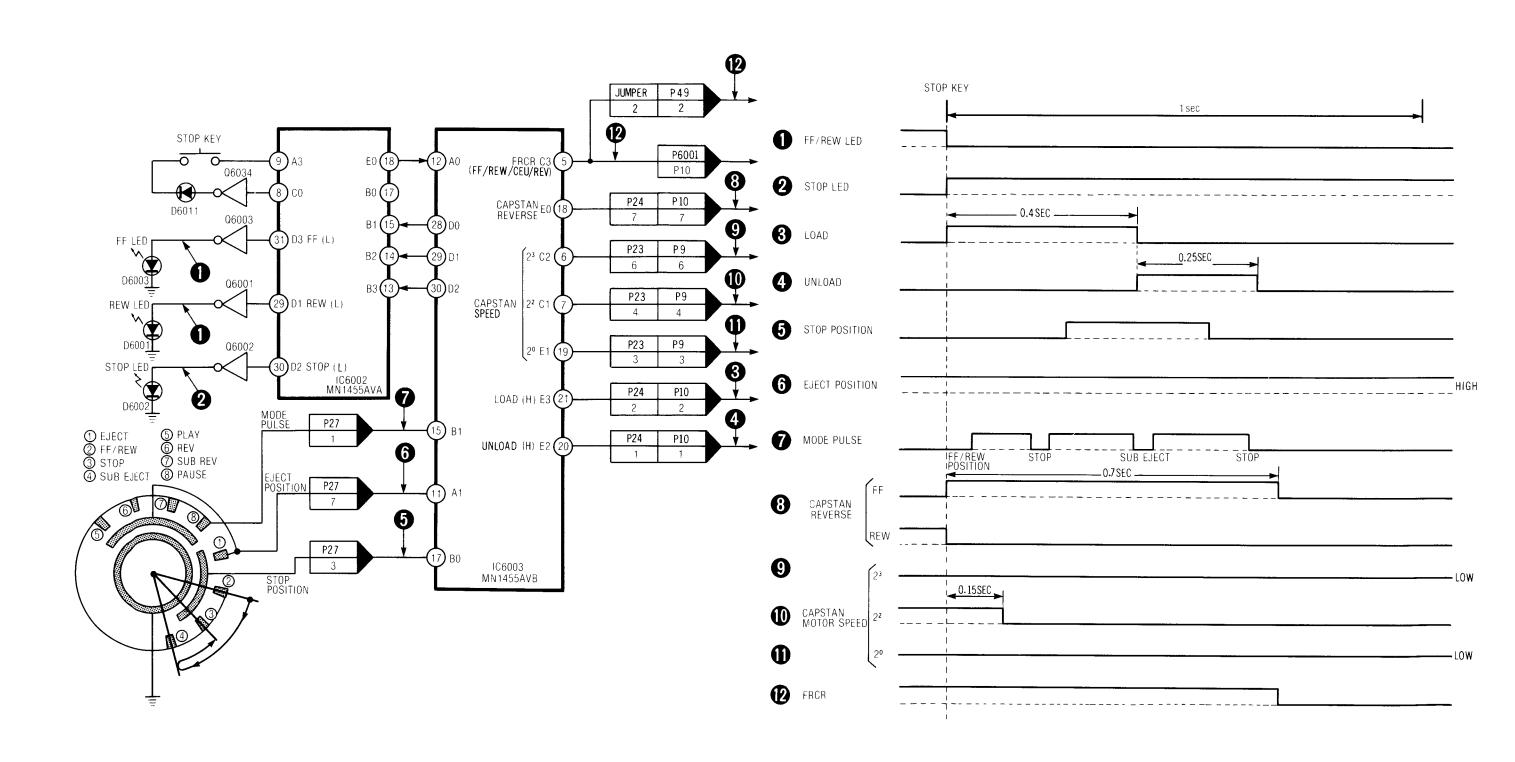
## PLAY → STOP BLOCK DIAGRAM (SYSTEM CONTROL)



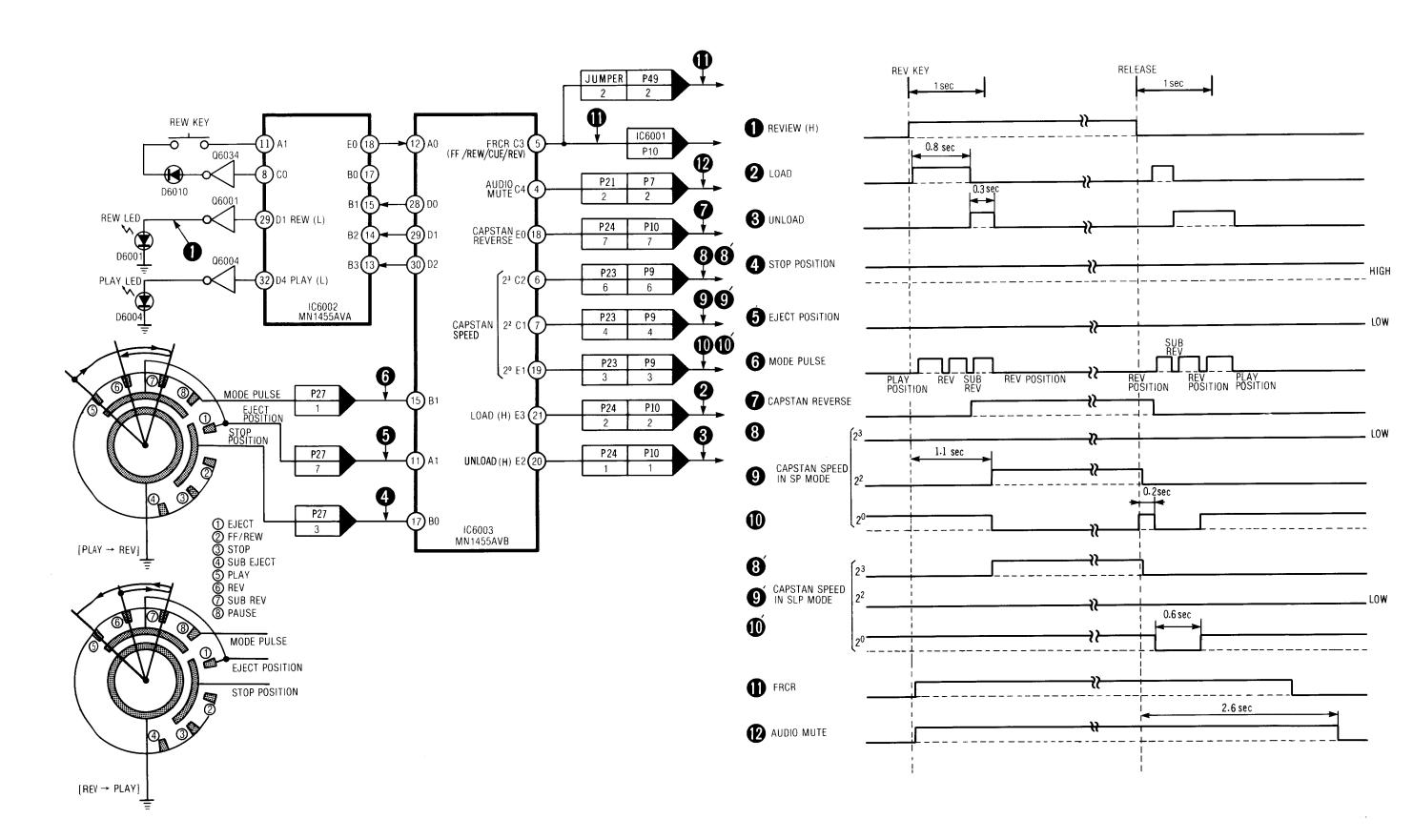
#### STOP → EJECT BLOCK DIAGRAM (SYSTEM CONTROL)



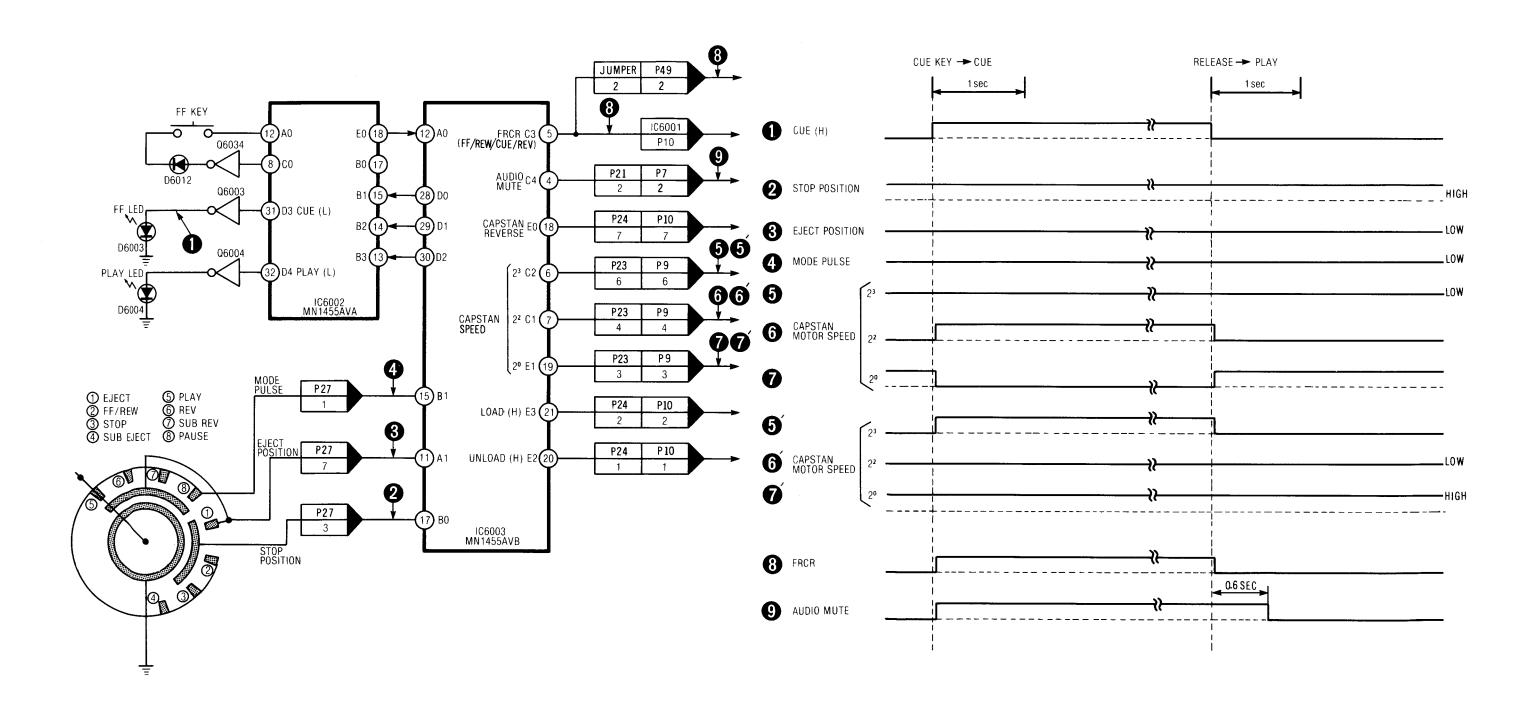
## FF/REW → STOP BLOCK DIAGRAM (SYSTEM CONTROL)



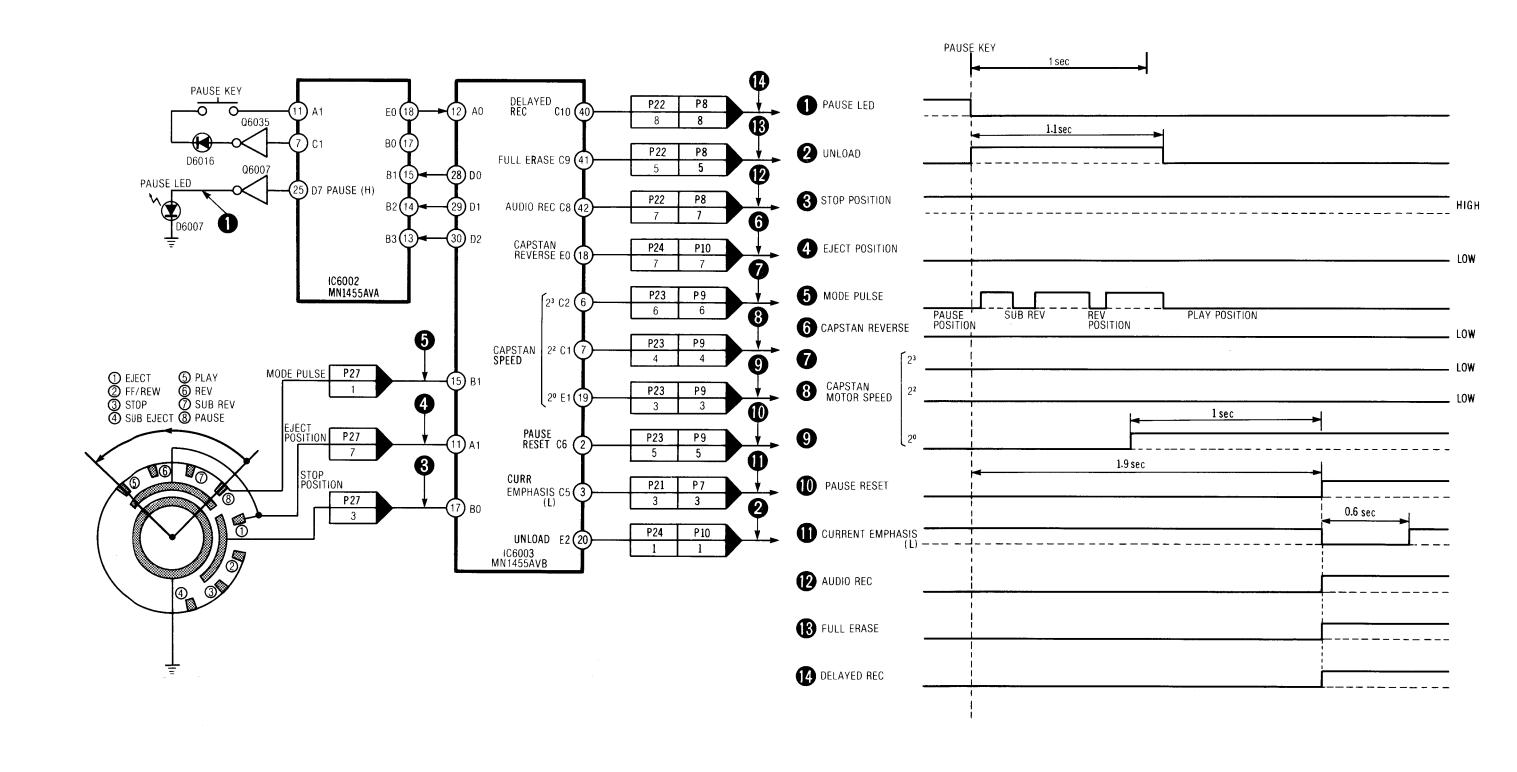
#### PLAY → REVIEW → PLAY BLOCK DIAGRAM (SYSTEM CONTROL)



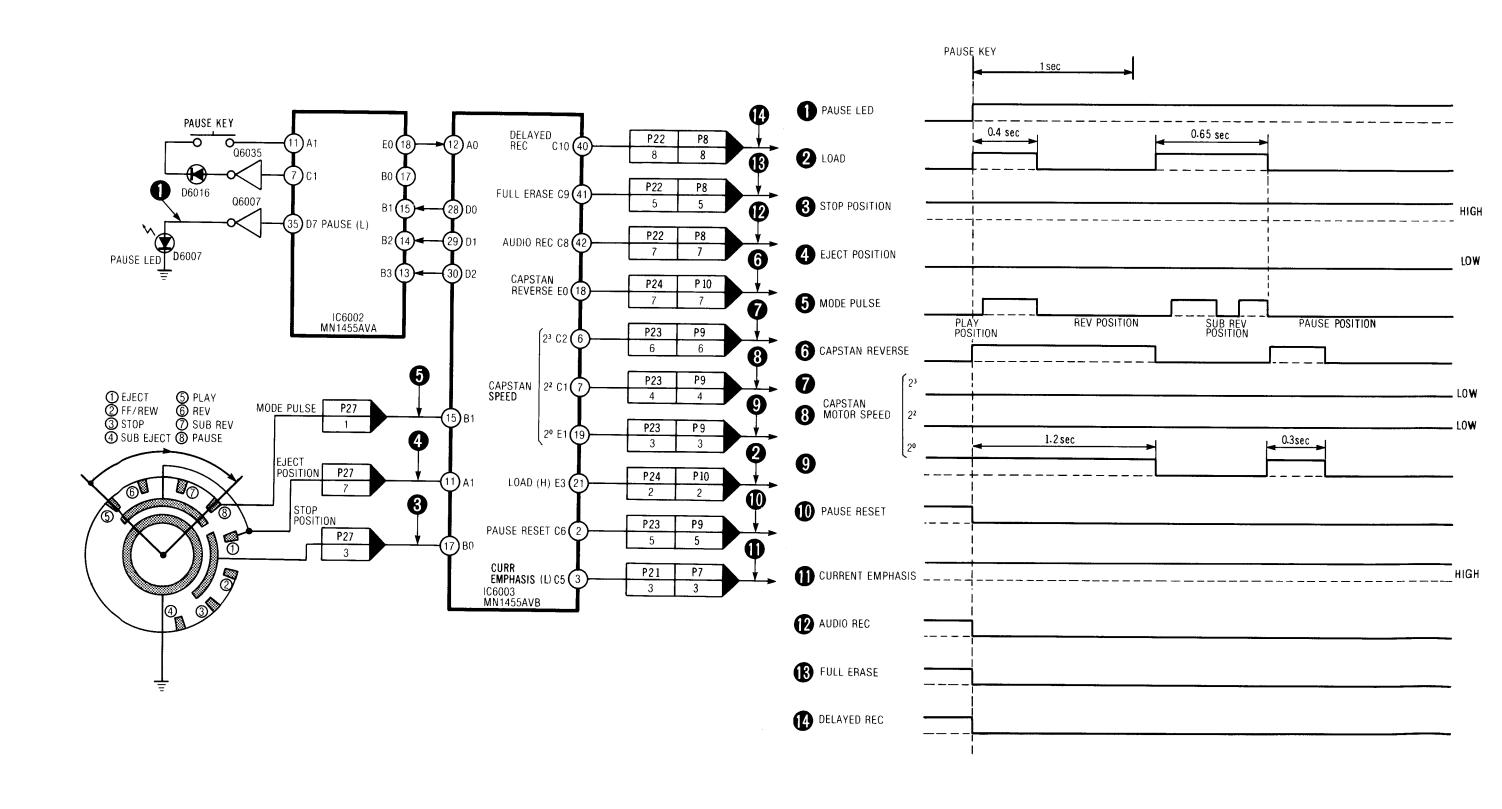
## PLAY → CUE → PLAY BLOCK DIAGRAM (SYSTEM CONTROL)



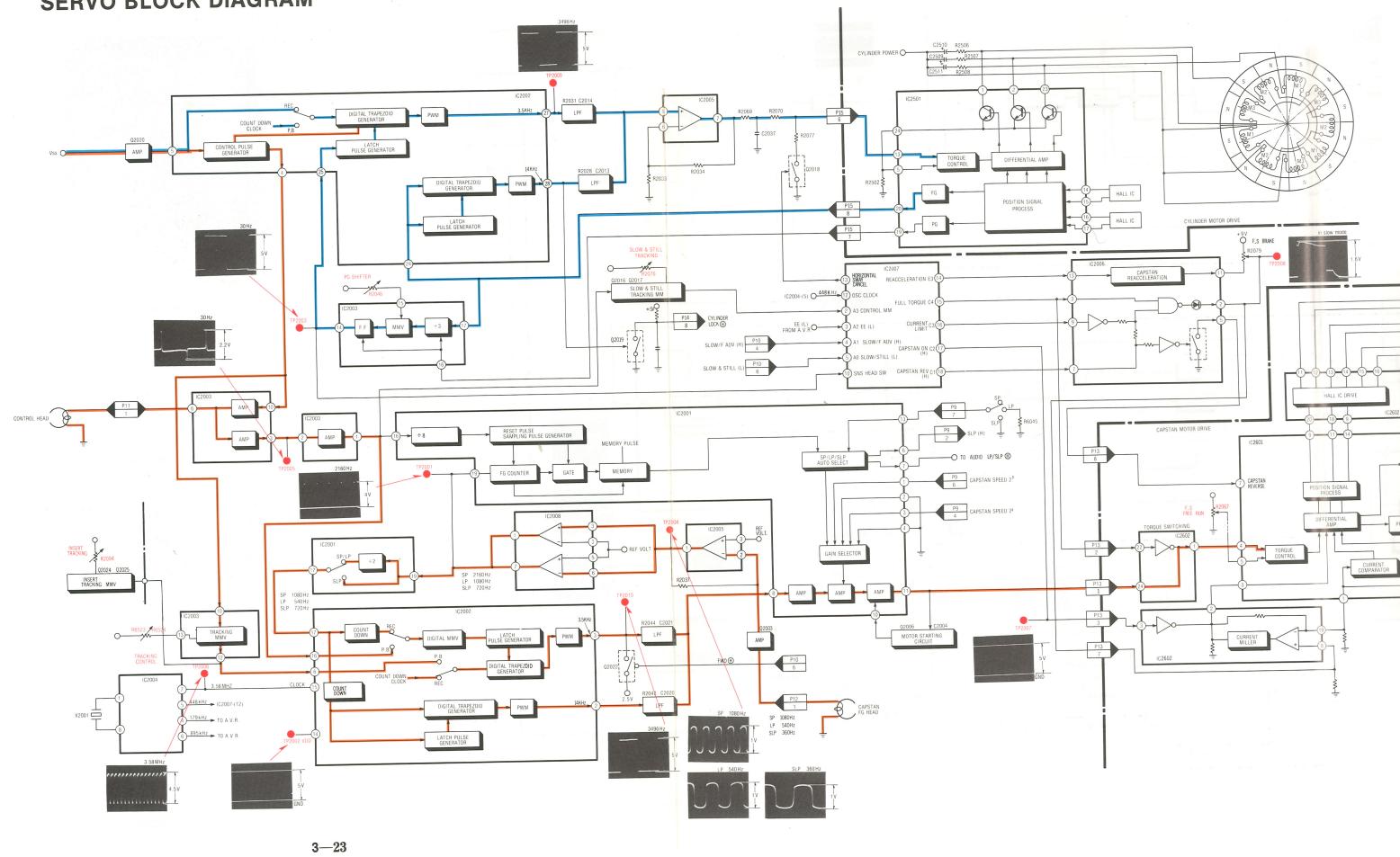
#### **REC. PAUSE** → **PAUSE RELEASE BLOCK DIAGRAM** (SYSTEM CONTROL)

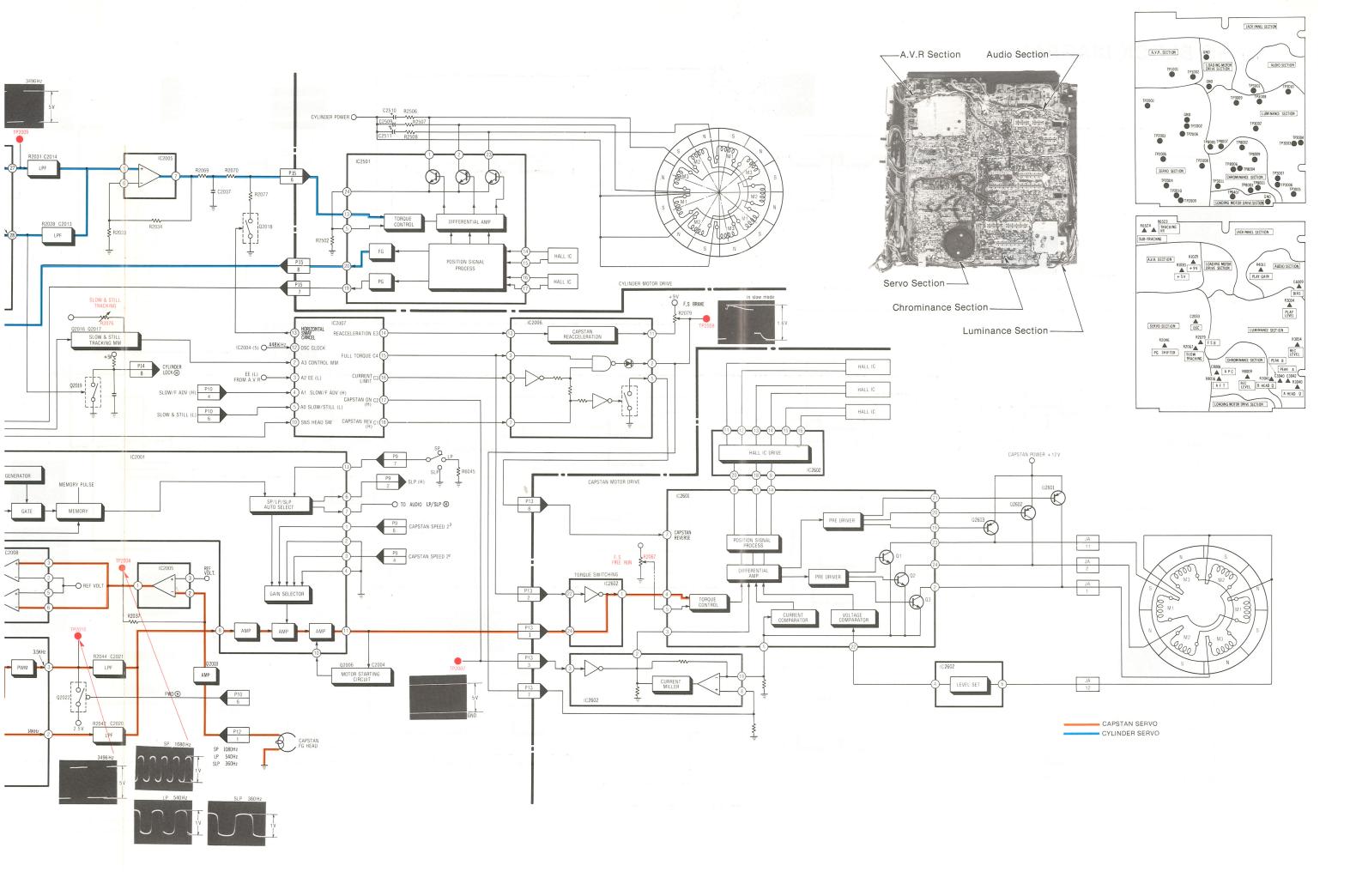


## REC. PLAY → PAUSE BLOCK DIAGRAM (SYSTEM CONTROL)

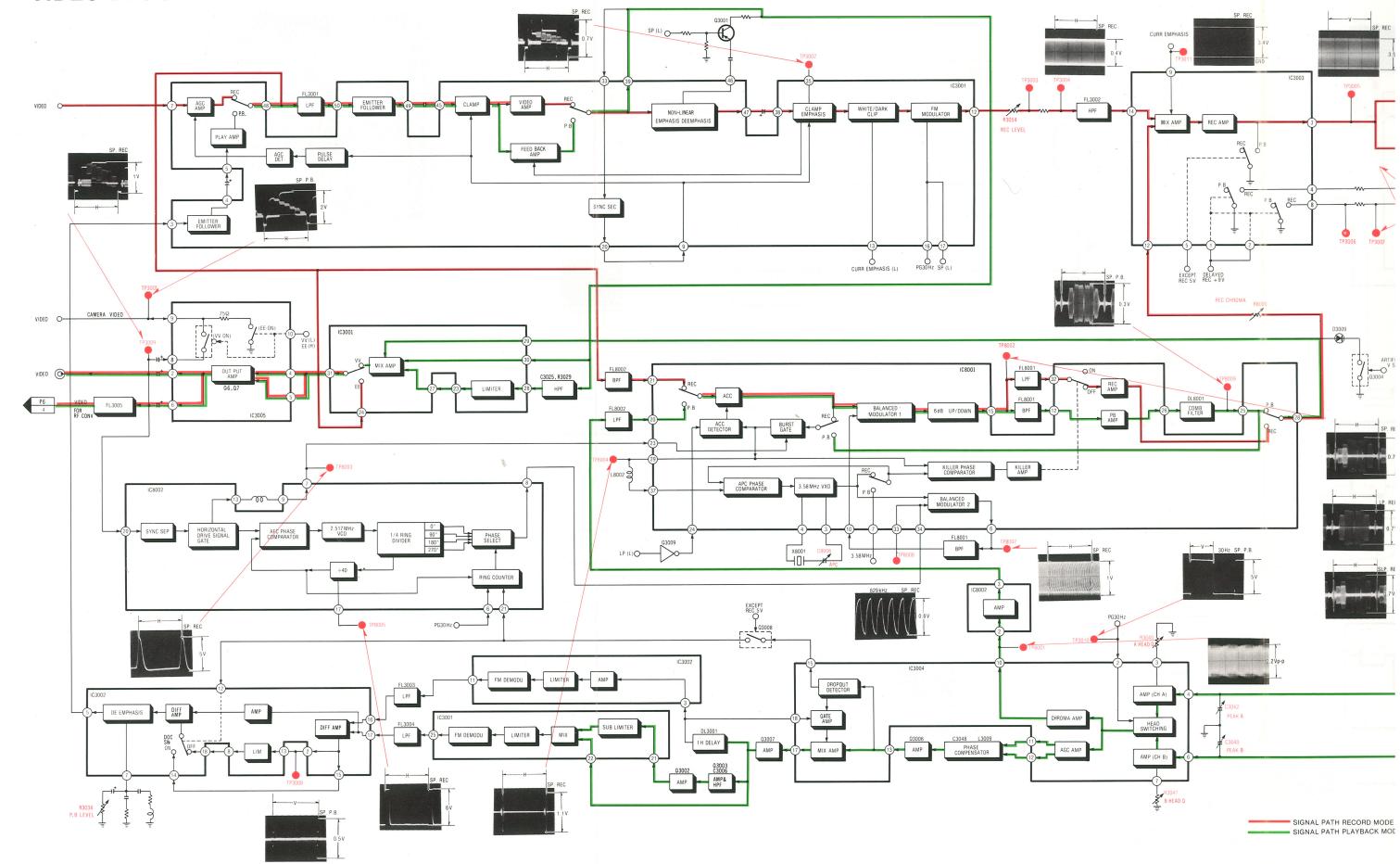


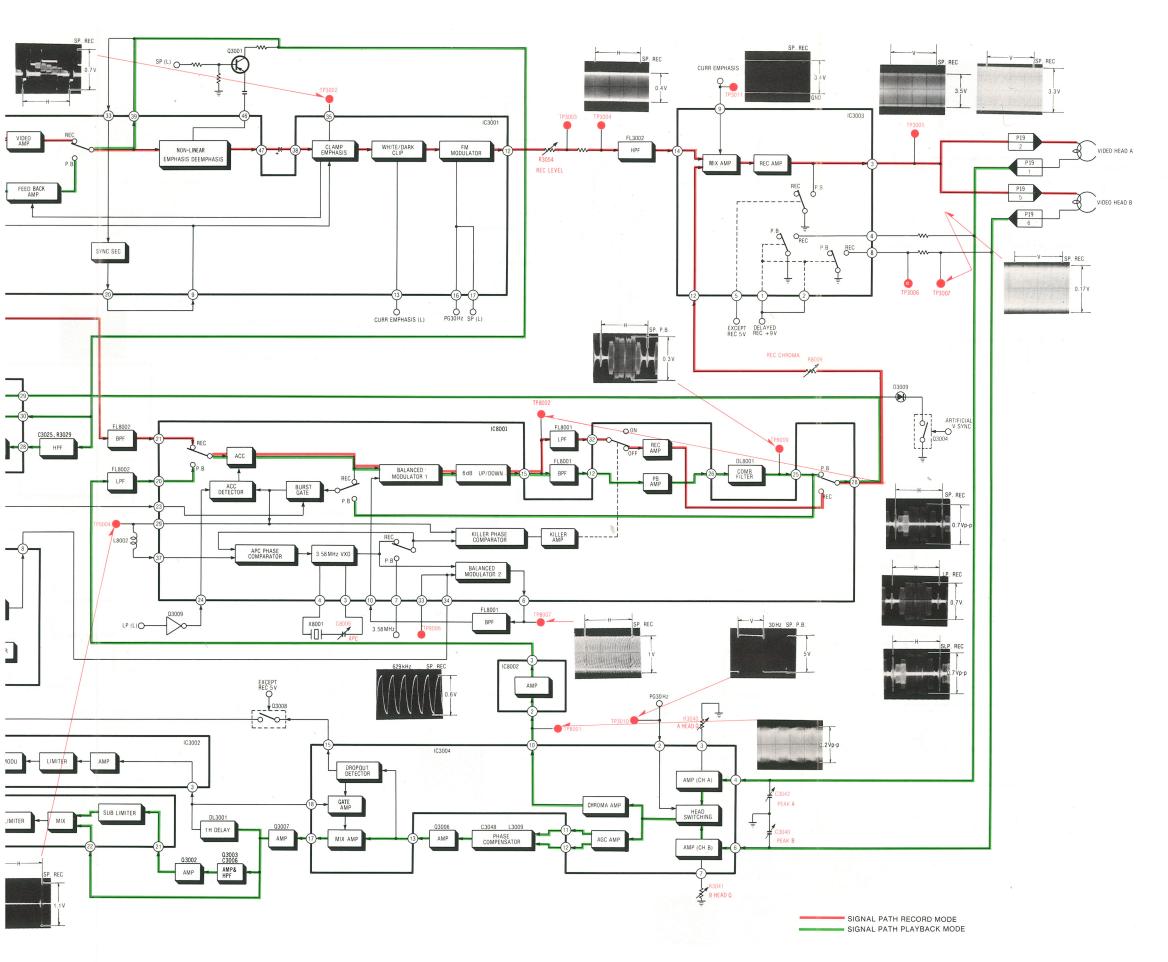
#### **SERVO BLOCK DIAGRAM**

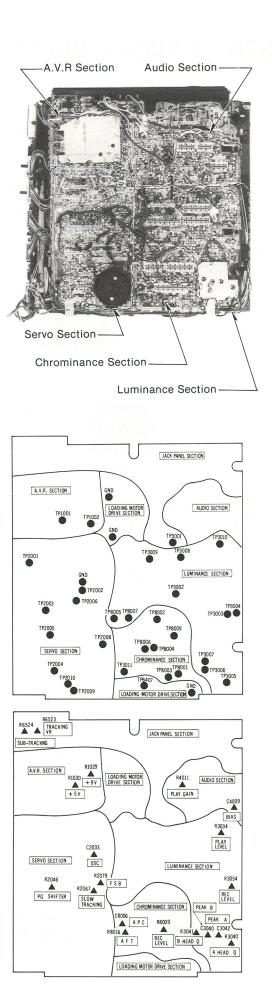




#### **VIDEO BLOCK DIAGRAM**

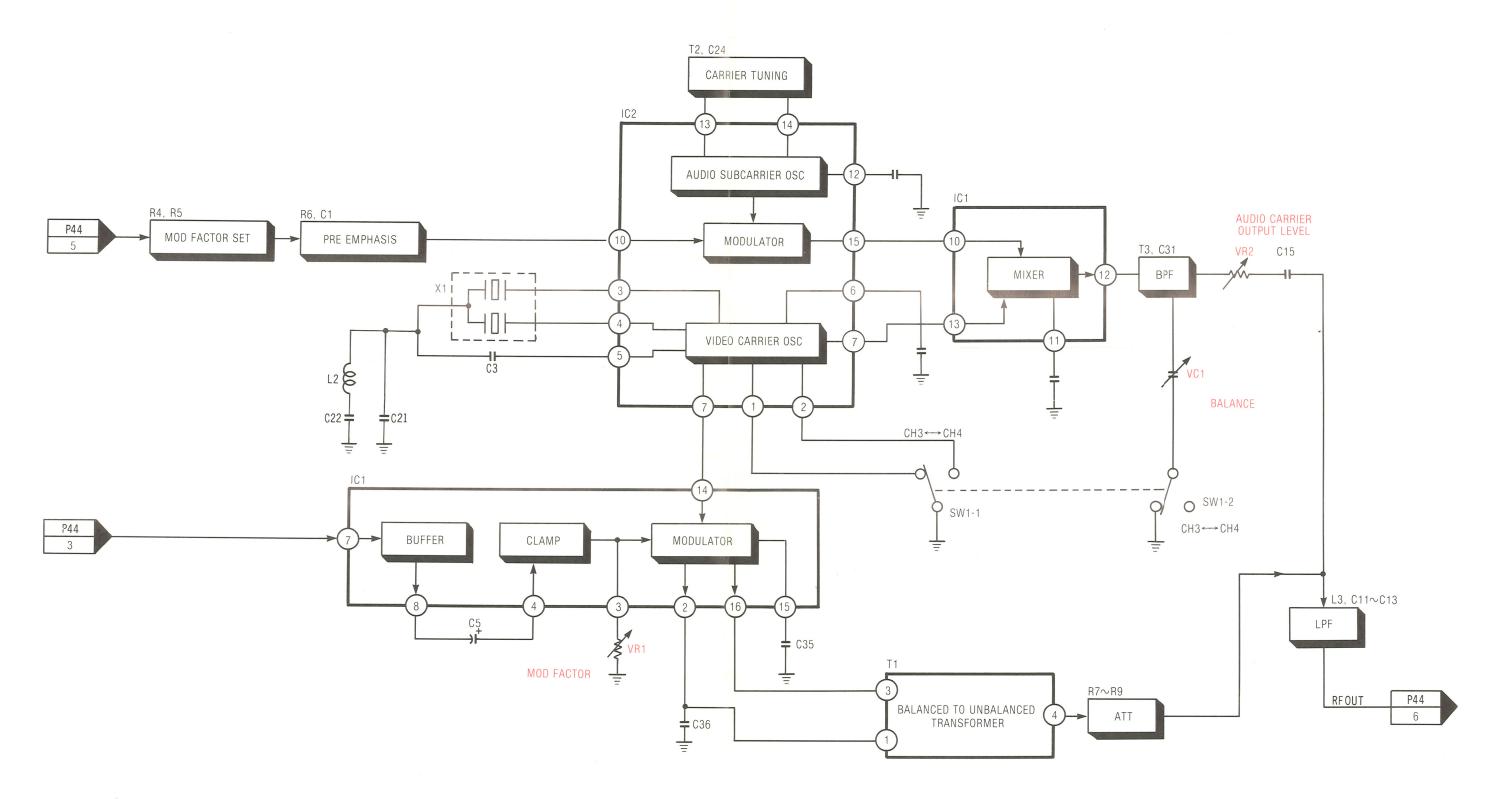




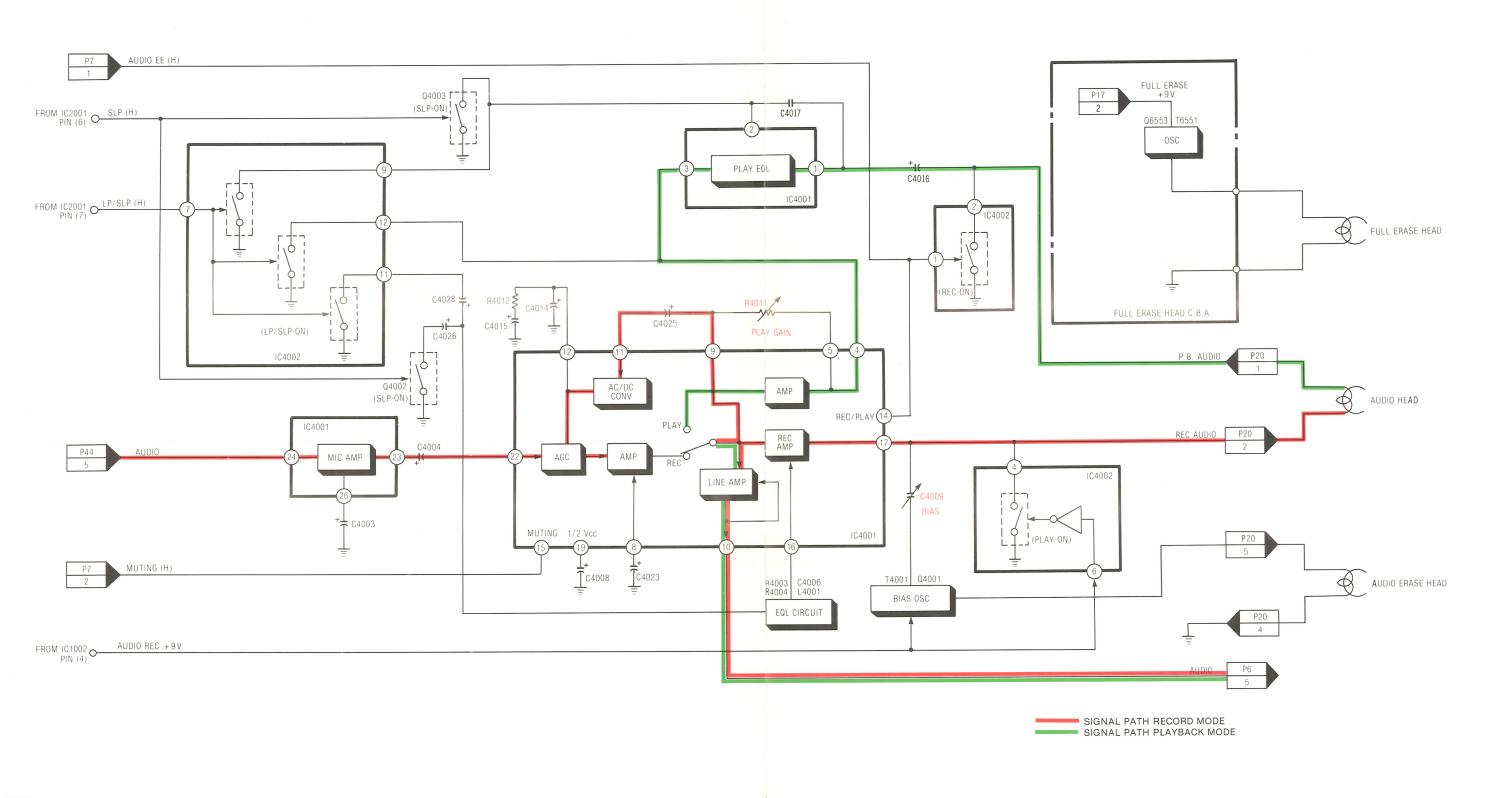


3-24

#### RF CONVERTER BLOCK DIAGRAM



#### **AUDIO BLOCK DIAGRAM**



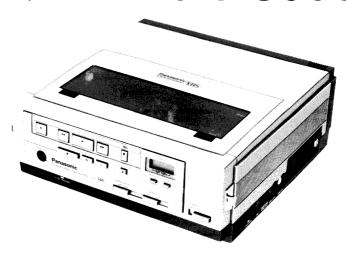
# Service Manua

Vol. 4

Schematic Diagrams **Printed Circuit Board Diagrams** 

Panasonic VHS

Portable Video Cassette Recorder



#### **SPECIFICATIONS**

Power Source:

Battery LCS-2012P Elec. Tuner Unit PV-A200 Prog. Tuner Unit PV-A500 Multiple AC Adaptor PV-A100 Plug-in AC Adaptor PV-A110

Approx. 7W at Play mode Power Consumption:

Television System: EIA Standard (525 lines, 60 fields)

NTSC color signal

Video Recording

System: 2 rotary heads helical scanning system

Luminance: FM azimuth recording Chrominance: Converted subcarrier phase shift recording

Audio Track:

Tape Format:

Tape width 1/2" (12.7 mm), high density

Tape Speed:

SP mode: 1-5/16 i.p.s (33.35 mm/s)

LP mode: 21/32 i.p.s (16.67 mm/s) SLP mode: 7/16 i.p.s (11.12 mm/s)

Record/Playback Time: 360 min. with NV-T120 used in SLP

FF/REW Time:

Heads:

Less than 6 min. with NV-T120

Video: 2 Rotary heads

Audio/Control: 1 stationary head

Erase: 1 full track erase

1 audio track erase for audio

dubbing

Input Level:

Video: VIDEO IN Jack (RCA type)  $1.0\,\mathrm{Vp}$ -p,  $75\Omega$  unbalanced

Audio: MIC IN Jack

 $-70\,dB$ ,  $600\Omega$  unbalanced

Output Level:

Video: VIDEO OUT Jack (RCA type)

 $1.0\,\mathrm{Vp}\text{-p}$ ,  $75\,\Omega$  unbalanced

Audio: AUDIO OUT Jack (RCA type)

 $-6 \, \mathrm{dB}, 600 \Omega$  unbalanced

RF Modulated: Ch3/Ch4 switchable,

 $72 dB\mu$  (open voltage),  $75\Omega$  unbalanced

Video Horizontal

Resolution: More than 230 lines

Audio Frequency

Response: SP: 100 Hz ~ 8 kHz,  $(10 dB down) LP: 100 Hz \sim 6 kHz,$ 

SLP:  $150 \,\mathrm{Hz} \sim 5 \,\mathrm{kHz}$ 

Signal-to-Noise Ratio: Video: SP mode: better than 40 dB

LP mode: better than 40dB SLP mode: better than 40dB (Rohde & Schwarz noise meter) Audio: SP mode: better than 42dB

LP mode: better than 40dB SLP mode: better than 40dB

Operating

Temperature:  $32^{\circ}F \sim 104^{\circ}F$  ( $0^{\circ}C \sim 40^{\circ}C$ )

Operating Humidity:  $10\% \sim 75\%$ 

Weight: 8.4 lbs (3.8kg) (with internal battery pack)

Dimensions:  $9-3/8 \text{ "(W)} \times 3-5/8 \text{ "(H)} \times 9-9/16 \text{ "(D)}$ 

 $238(W) \times 92.5(H) \times 242(D) mm$ 

Weight and dimensions shown are approximate. Specifications are subject to change without notice.

## Panasonic

Panasonic Company Division of Matsushita Electric Corporation of America One Panasonic Way, Secaucus New Jersey 07094

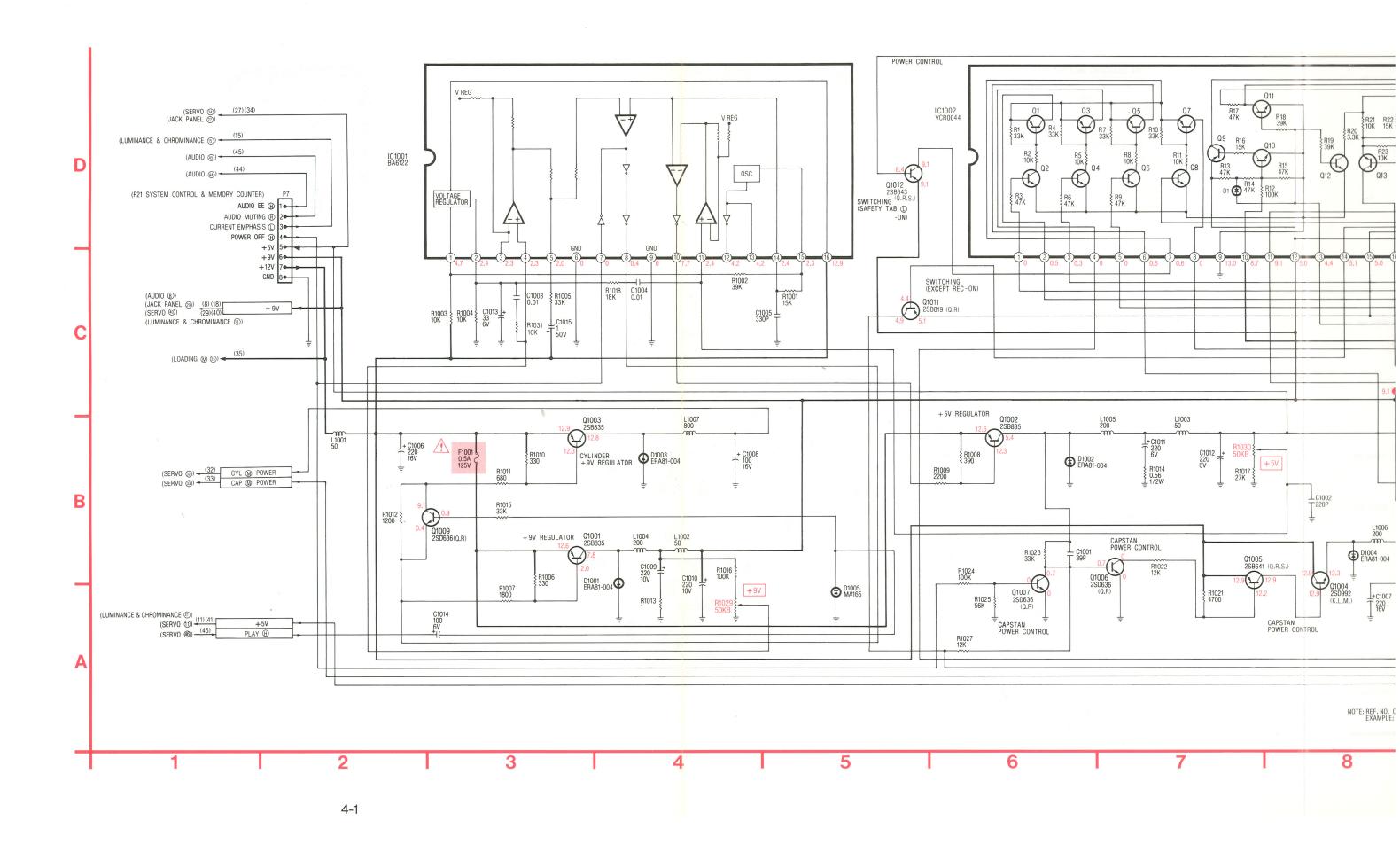
Panasonic Hawaii Inc 91-238 Kauhi St. Ewa Beach P.O. Box 774 Honolulu, Hawaii 96808-0774

Division of Matsushita Electric of Canada Limited 5770 Ambler Drive, Mississauga, Ontario, L4W 2T3

Panasonic Sales Company, Division of Matsushita Electric of Puerto Rico, Inc. Ave, 65 De Infanteria, KM 9.7 Victoria Industrial Park Carolina, Puerto Rico 00630

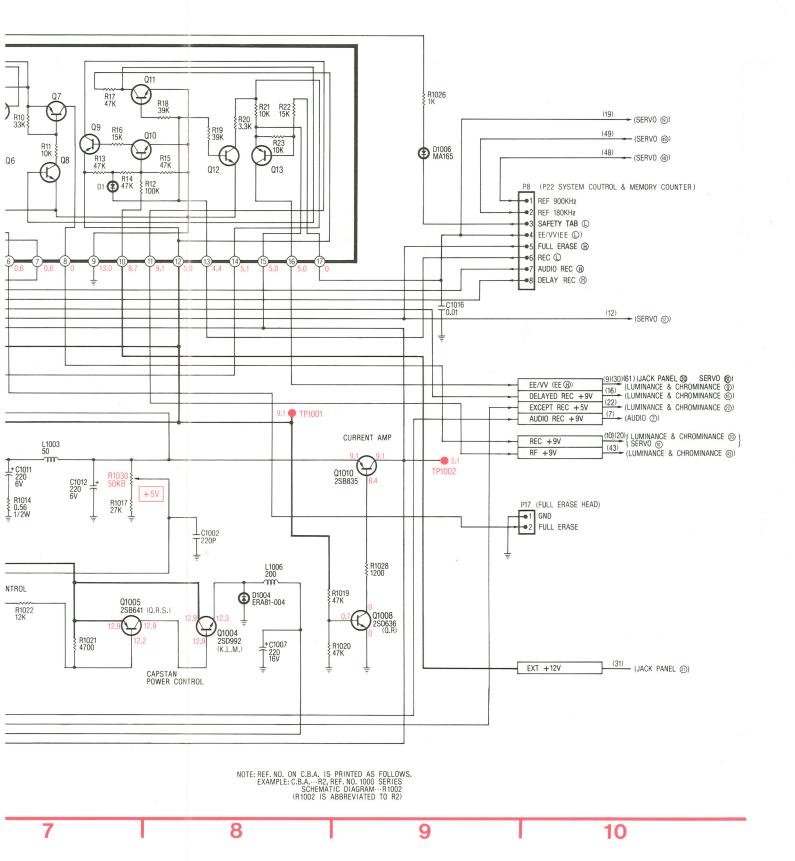
#### **CONTENTS**

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LUMINANCE & CHROMINANCE CIRCUIT 4- 9
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INTERCONNECTION SCHEMATIC DIAGRAM
NOTE -
SAME COLOR CODE AS RESISTORS IS PRINTED ON CONNECTOR HOUSING OF FOUR OR LESS
PINS TO INDICATE LAST NUMBER OF THE REFERENCE NUMBER.
PINS TO INDICATE LAST NOWIDER OF THE REFERENCE NOWIDER.
2P 3P 4P 77 / /
/D/X / / /// / ////
/W//
·COLOR CODE



THE VOLTAGE MEASUREMENTS GIVEN IN THIS DRAWING ARE COLOR BAR SIGNAL IN STOP

CALLOUTS NEXT TO WIRING PLUGS INDICATE CONNECTIONS TO OTHER SCHEMATIC DIAGRAM.



P7 (A.V.R. C.B.A.) PIN NO. SIGNAL NAME DESTINATION AUDIO EE (H) P21-1 SYSTEM CONTROL & MEMORY COUNTER C.B.A. AUDIO MUTING (H) P21-2 SYSTEM CONTROL & MEMORY COUNTER C.B.A. CURRENT EMPHASIS ( P21-3 SYSTEM CONTROL & MEMORY COUNTER C.B.A. POWER OFF (H) P21-4 SYSTEM CONTROL & MEMORY COUNTER C.B.A. +5V P21-5 SYSTEM CONTROL & MEMORY COUNTER C.B.A. +9V P21-6 SYSTEM CONTROL & MEMORY COUNTER C.B.A. +12V P21-7 SYSTEM CONTROL & MEMORY COUNTER C.B.A. GND P21-8 SYSTEM CONTROL & MEMORY COUNTER C.B.A.

	P8 (A.V.R. C.B.A.)					
PIN NO.	SIGNAL NAME	DESTINATION				
1	REF 900KHz	P22-1 SYSTEM CONTROL & MEMORY COUNTER C.B.A.				
2	REF 180KHz	P22-2 SYSTEM CONTROL & MEMORY COUNTER C.B.A.				
3	SAFETY TAB (	P22-3 SYSTEM CONTROL & MEMORY COUNTER C.B.A.				
4	EE/VV (EE ())	P22-4 SYSTEM CONTROL & MEMORY COUNTER C.B.A.				
5	FULL ERASE (H)	P22-5 SYSTEM CONTROL & MEMORY COUNTER C.B.A.				
6	REC (	P22-6 SYSTEM CONTROL & MEMORY COUNTER C.B.A.				
7	AUDIO REC (H)	P22-7 SYSTEM CONTROL & MEMORY COUNTER C.B.A.				
8	DELAY REC (H)	P22-8 SYSTEM CONTROL & MEMORY COUNTER C.B.A.				

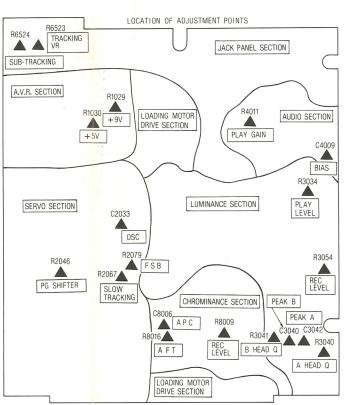
P17 (A.V.R. C.B.A.)				
PIN NO.	SIGNAL NAME	DESTINATION		
1	GND	P48-1 FULL ERASE HEAD C.B.A.		
2	FULL ERASE	P48-2 FULL ERASE HEAD C.B.A.		

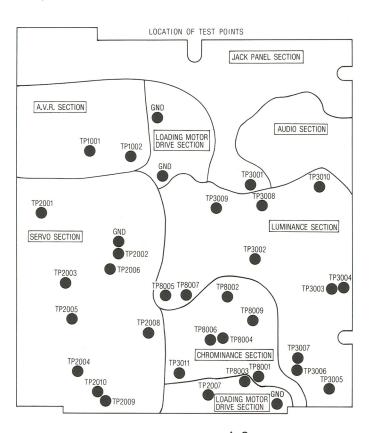


4-1

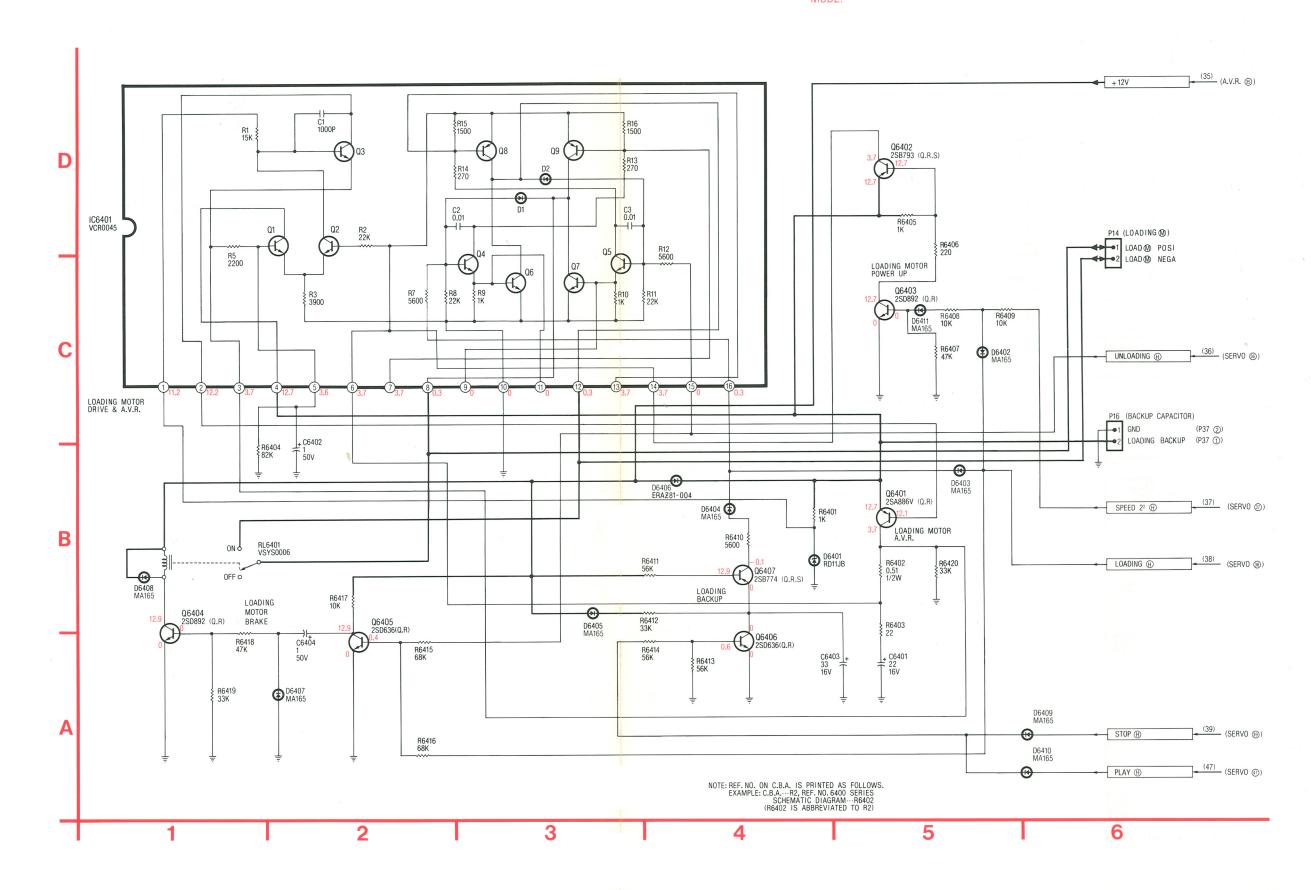
A.V.R.

SCHEMATIC DIAGRAM





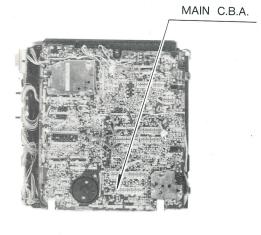
4-2 LOADING MOTOR SCHEMATIC DIAGRAM

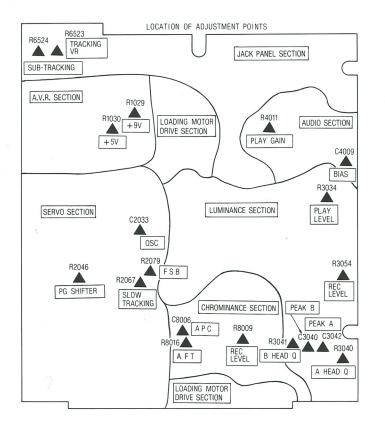


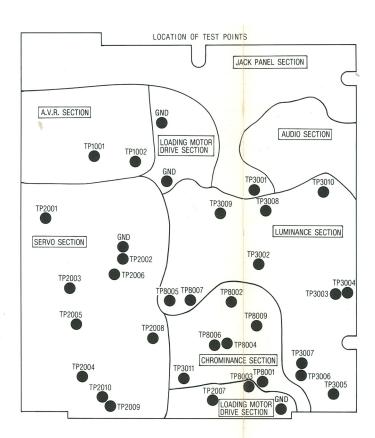
	P14 (LOADING MOTOR DRIVE C.B.A.)				
PIN NO.	SIGNAL NAME	DESTINATION			
1	LOAD M POSI	M1552 LOADING MOTOR			
2	LOAD M NEGA	M1552 LOADING MOTOR			

100	P16 (LOADING MOTOR DRIVE C.B.A.)				
PIN NO.	SIGNAL NAME	DESTINATION			
1	GND	P37-2 SUB SYSTEM CONTROL C.B.A.			
2	LOAD BACKUP	P37-1 SUB SYSTEM CONTROL C.B.A.			

CALLOUTS NEXT TO WIRING PLUGS INDICATE CONNECTIONS TO OTHER SCHEMATIC DIAGRAM.







	STOP		REC			PLAY			
	E	В	C	E	В	С	E	В	С
Q6401	12.8	12.2	3.7	12.7	12.1	3.7	12.6	12.2	3.7
Q6402	12.8	12.8	3.7	12.7	12.7	3.7	12.7	12.7	3.7
Q6403	0	0	12.8	0	0	12.7	0	0	12.8
Q6404	0	0	12.9	0	0	12.9	0	0	12.9
Q6405	0	0.4	12.9	0	0.4	12.9	0	0.4	12.9
Q6406	0	0.6	0	0	0.6	0	0	0.6	0
Q6407	0	12.9	-0.2	0	12.9	-0.1	0	12.8	-0.2

PIN NO.	IC 6401				
TIN NO.	STOP	REC	PLAY		
PIN 1	11.2	11.2	11.2		
PIN 2	12.2	12.2	12.1		
PIN 3	3.7	3.7	3.7		
PIN 4	12.7	12.7	12.7		
PIN 5	3.6	3.6	3.6		
PIN 6	3.7	3.7	3.7		
PIN 7	3.7	3.7	3.7		
PIN 8	0.4	0.3	0.4		
PIN 9	0	0	0		
PIN 10	0	0	0		
PIN 11	0	0	0		
PIN 12	0.4	0.3	0.4		
PIN 13	3.7	3.7	3.7		
PIN 14	3.7	3.7	3.7		
PIN 15	0	0	0		
PIN 16	0.3	0.3	0.3		

VOLTAGE MEASUREMENTS: COLOR BAR SIGNAL IN SP MODE.

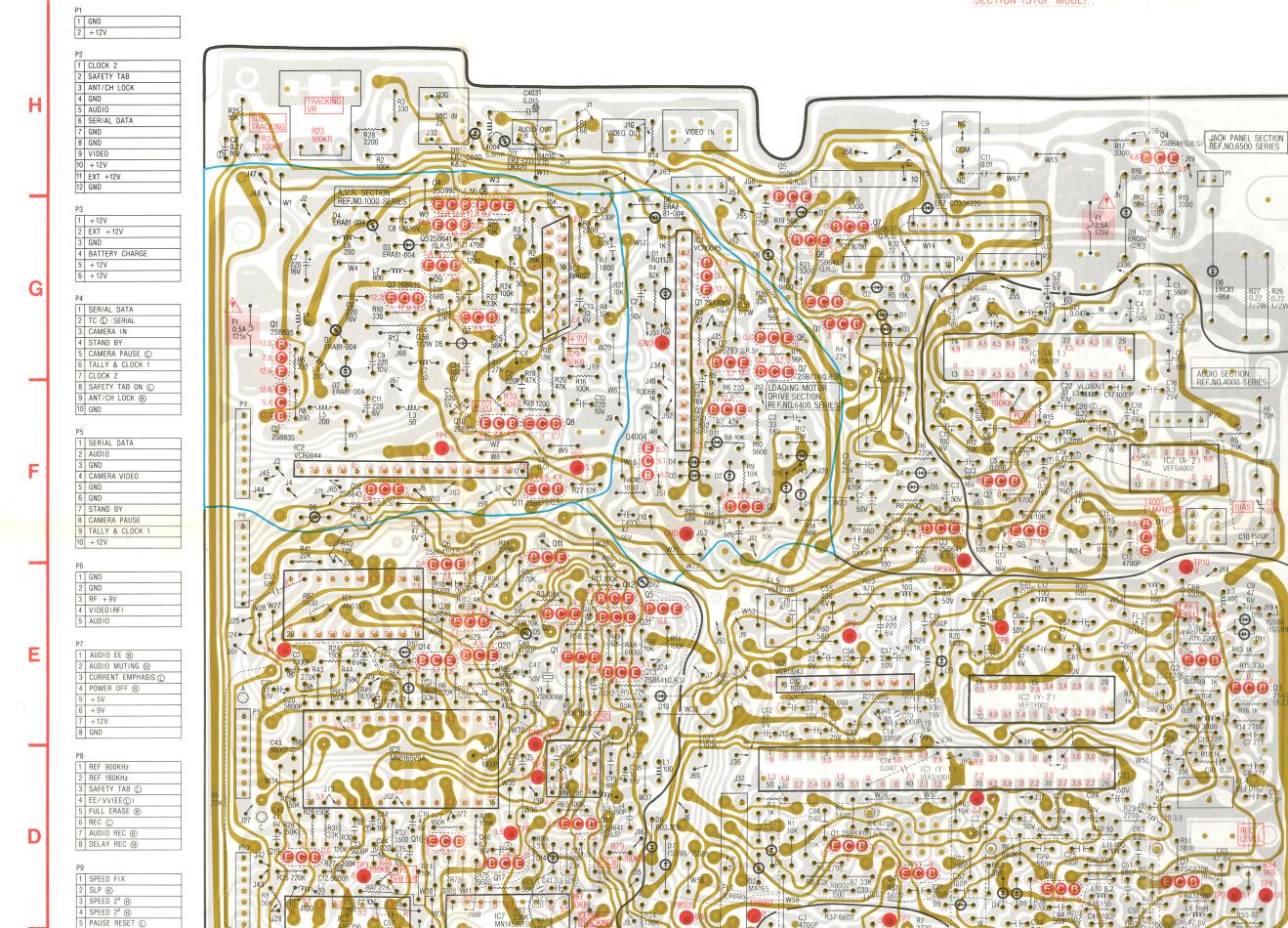
#### MAIN C.B.A. (VEPS0317A)

6 SPEED 2<sup>3</sup> H 7 SP/LP/SLP **IMPORTANT SAFETY NOTICE:** 

COMPONENTS IDENTIFIED BY THE SIGN A HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

THE VOLTAGE MEASUREMENTS GIVEN IN THIS DRAWING ARE COLOR BAR SIGNAL IN SP-REC

EXCEPT A.V.R. SECTION AND JACK PANEL SECTION (STOP MODE).

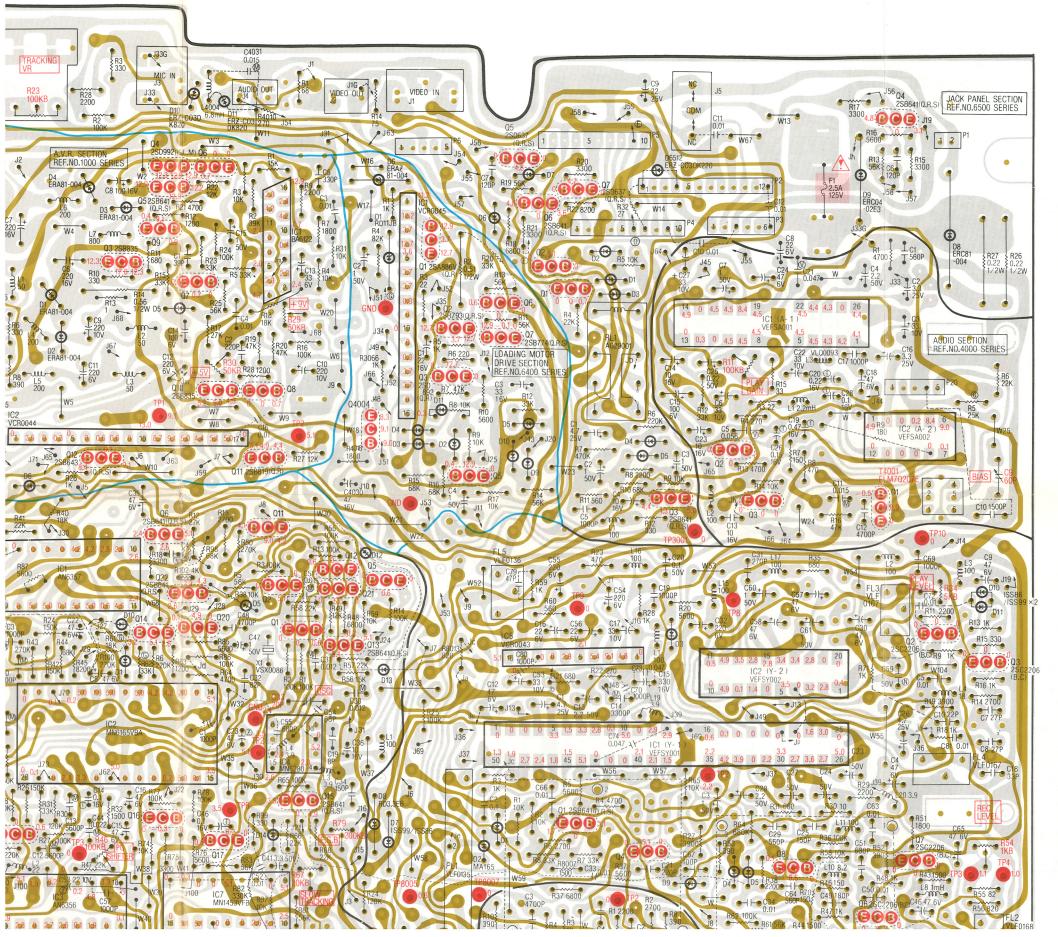


7A)

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ANVEROMENT HAVE
SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS, USE
ONLY THE SPECIFIED PARTS.

THE VOLTAGE MEASUREMENTS GIVEN IN THIS DRAWING ARE COLOR BAR SIGNAL IN SP-REC

EXCEPT A.V.R. SECTION AND JACK PANEL SECTION (STOP MODE).



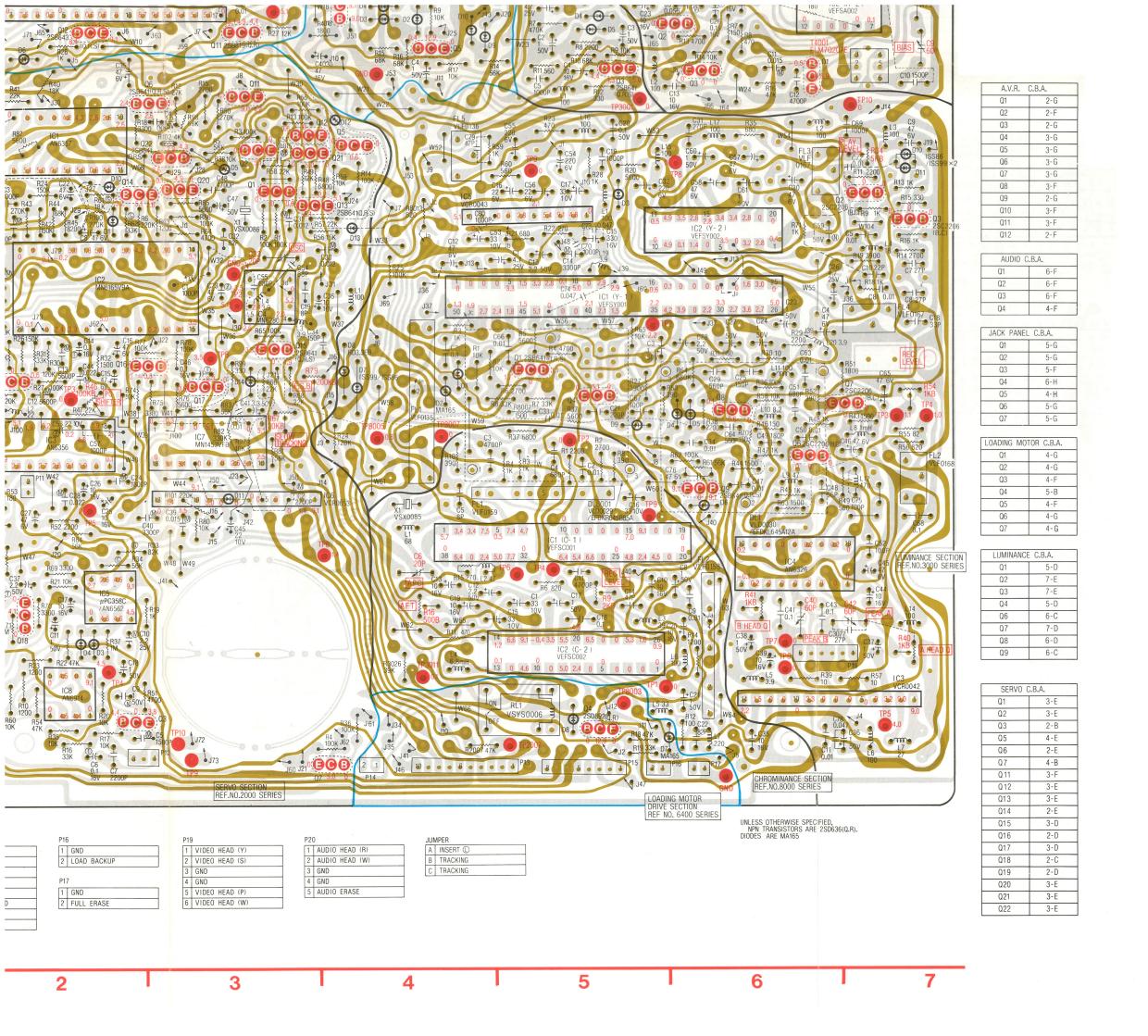
A.V.R.	C.B.A.
Q1	2-G
Q2	2-F
Q3	2-G
Q4	3-G
Q5	3-G
Q6	3-G
Q7	3-G
Q8	3-F
Q9	2-G
Q10	3-F
Q11	3-F
Q12	2-F

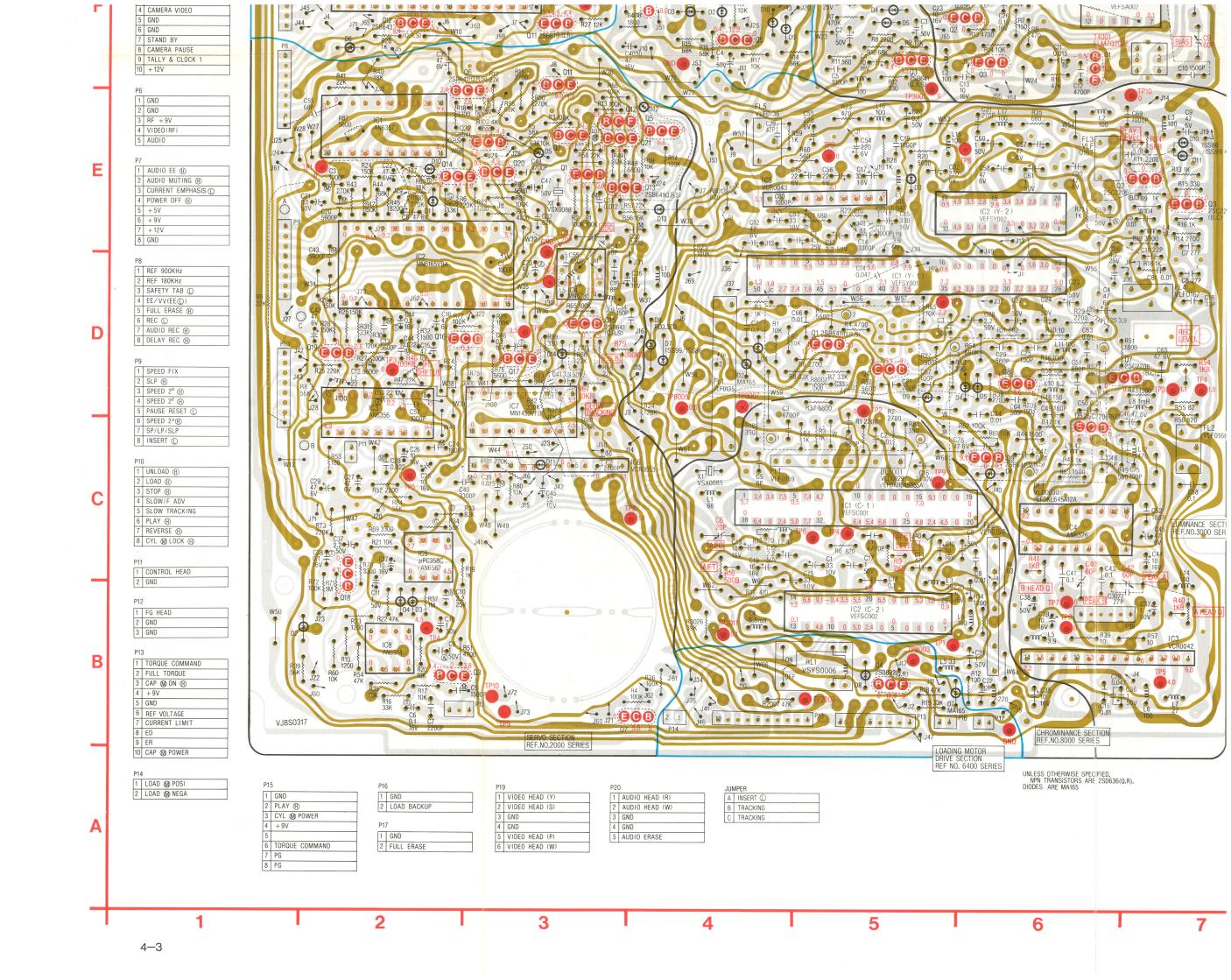
AUDIO C	.B.A.
Q1	6-F
Q2	6-F
Q3	6-F
Q4	4-F

JACK PANEL	C.B.A.
Q1	5-G
Q2	5-G
Q3	5-F
Q4	6-H
Q5	4-H
Q6	5-G
Q7	5-G

LOADING	MOTOR C.B.A.
Q1	4-G
0.0	1.0

4-3 MAIN C.B.A. (A.V.R. & LOADING MOTOR SECTION)





#### **MAIN C.B.A. (VEPS0317A)**

1 GND 2 +12V

1 CLOCK 2 2 SAFETY TAE 3 ANT/CH LOCK 4 GND 5 AUDIO 6 SERIAL DATA

7 GND

8 GND 9 VIDEO + 12V 11 EXT +12V

1 +12V 2 EXT +12V 4 BATTERY CHARGE 5 +12V 6 +12V

1 SERIAL DATA TC (C) / SERIAL CAMERA IN STAND BY CAMERA PAUSE ( TALLY & CLOCK 1

CLOCK 2 SAFETY TAB ON C 9 ANT/CH LOCK (H)

1 SERIAL DATA AUDIO

CAMERA VIDEO

6 GND STAND BY 8 CAMERA PAUSE 9 TALLY & CLOCK 1 10 + 12V

1 GND GND 3 RF +9V 4 VIDEO(RF 5 AUDIO

1 AUDIO EE (H) AUDIO MUTING (A)

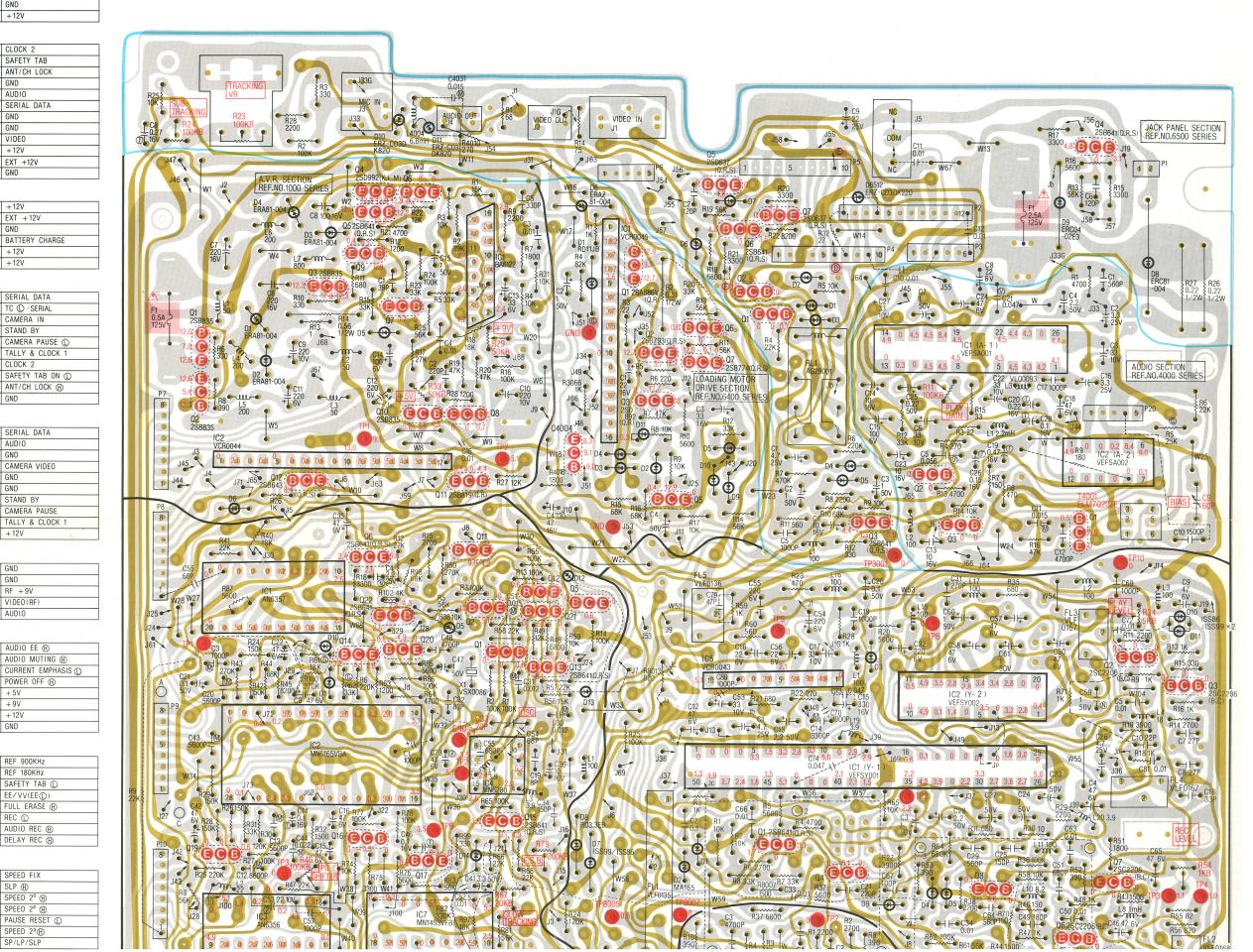
4 POWER OFF (A) 5 + 5V 6 +9V 7 + 12V 8 GND

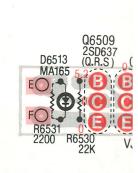
1 REF 900KHz 2 REF 180KHz 3 SAFETY TAB ( 4 EE/VV(EEC 5 FULL ERASE AUDIO REC 8 DELAY REC

1 SPEED FIX 2 SLP (H) 3 SPEED 2° 4 SPEED 2<sup>2</sup> 5 PAUSE RESET ( 6 SPEED 2<sup>3</sup>⊕

**IMPORTANT SAFETY NOTICE:** COMPONENTS IDENTIFIED BY THE SIGN A HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

THE VOLTAGE MEASUREMENTS GIVEN IN THIS DRAWING ARE COLOR BAR SIGNAL IN SP-REC EXCEPT A.V.R. SECTION AND JACK PANEL SECTION (STOP MODE).





A.V.H. C.B.A.		
Q1	2-G	
Q2	2-F	
Q3	2-G	
Q4	3-G	
Q5	3-G	
Q6	3-G	
Q7	3-G	
Q8	3-F	
Q9	2-G	
Q10	3-F	
Q11	3-F	
Q12	2-F	

AUDIO	C.B.A.
Q1	6-F
Q2	6-F
Q3	6-F
Q4	4-F

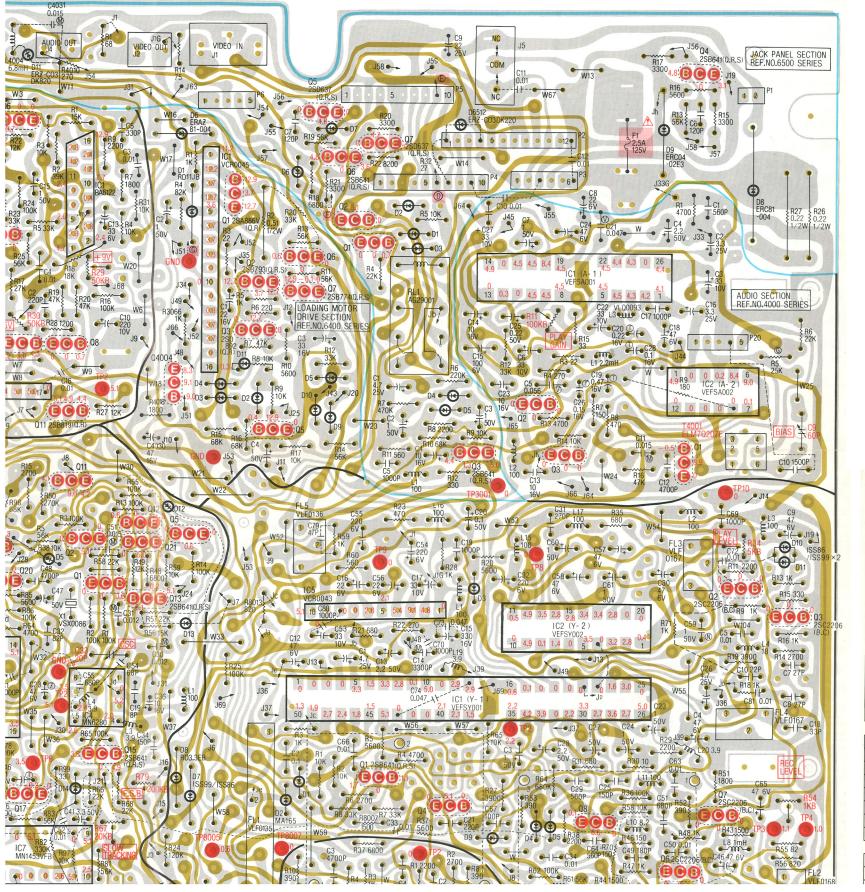
JACK PAN	EL C.B.A.
Q1	5-G
Q2	5-G
Q3	5-F
Q4	6-H
Q5	4-H
Q6	5-G
Q7	5-G
Q7	5-G

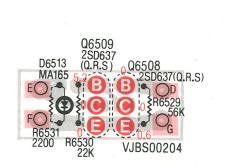
LOADING	MOTOR	C.B.A.	
Q1		4-G	
			_

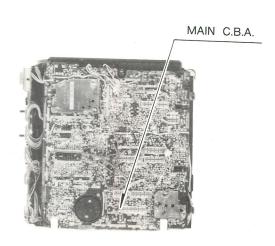
**IMPORTANT SAFETY NOTICE:** 

COMPONENTS IDENTIFIED BY THE SIGN A HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACED ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

THE VOLTAGE MEASUREMENTS GIVEN IN THIS DRAWING ARE COLOR BAR SIGNAL IN SP-REC EXCEPT A.V.R. SECTION AND JACK PANEL SECTION (STOP MODE).





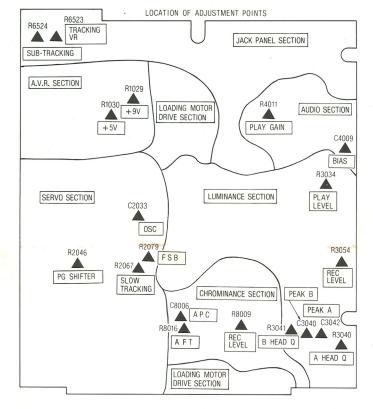


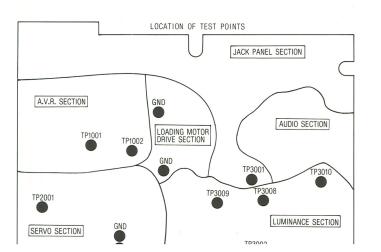
A.V.R. C.B.A.		
Q1	2-G	
Q2	2-F	
Q3	2-G	
Q4	3-G	
Q5	3-G	
Q6	3-G	
Q7	3-G	
Q8	3-F	
Q9	2-G	
Q10	3-F	
Q11	3-F	
Q12	2-F	

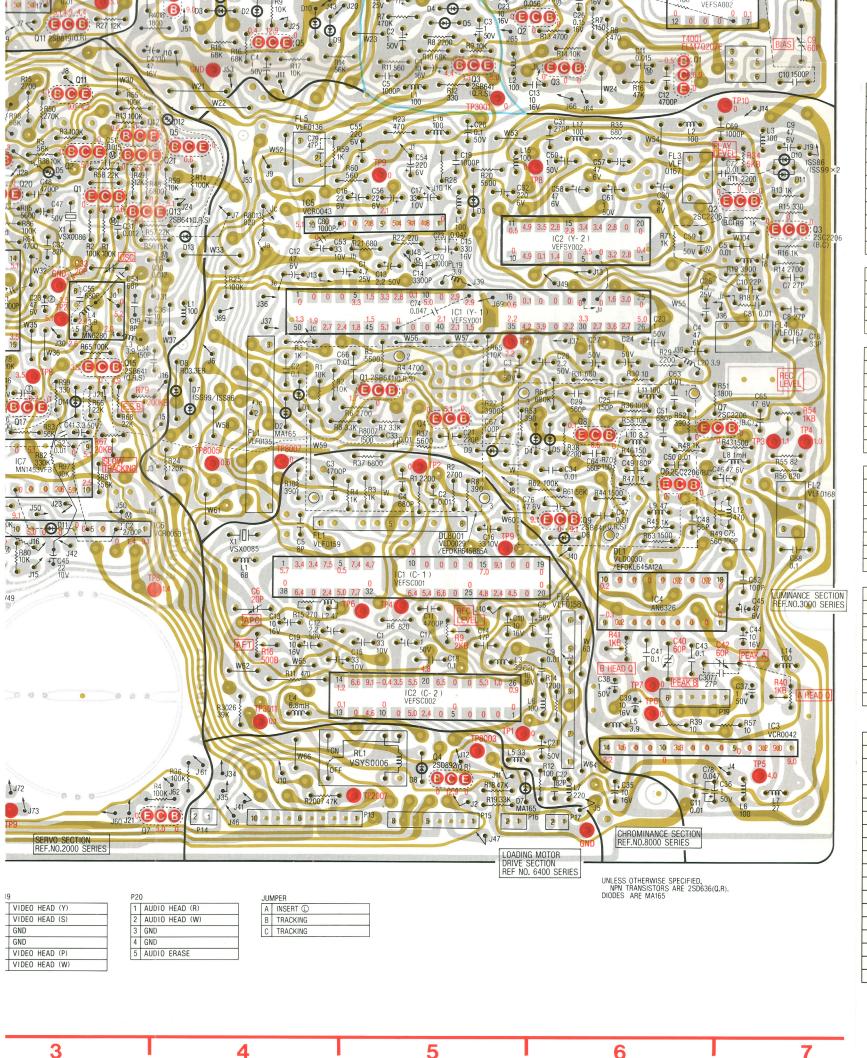
AUDIO C	.B.A.
Q1	6-F
Q2	6-F
Q3	6-F
Q4	4-F

JACK PANEL C.B.A.			
Q1	5-G		
Q2	5-G		
Q3	5-F		
Q4	6-H		
Q5	4-H		
Q6	5-G		
Q7	5-G		
The said the			

LOADING	MOT	OR	C.B.A.	_
Q1			4-G	







A.V.R. C	
	2-G
Q2	2-F
Q3	2-G
Q4	3-G
Q5	3-G
Q6	3-G
Q7	3-G
Q8	3-F
Q9	2-G
Q10	3-F
Q11	3-F
Q12	2-F

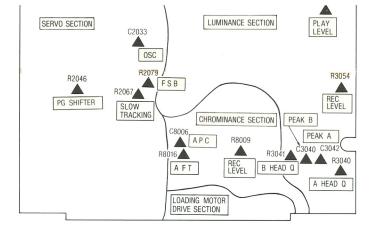
AUDIO C.	B.A.
Q1	6-F
Q2	6-F
Q3	6-F
Q4	4-F

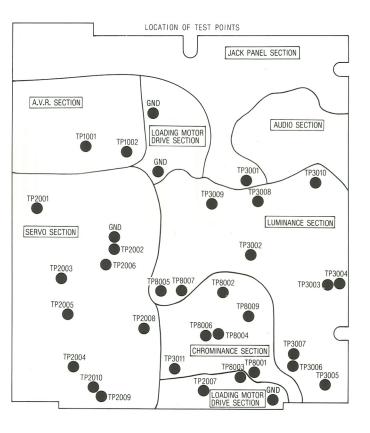
JACK PANEL	C.B.A.
Q1	5-G
Q2	5-G
Q3	5-F
Q4	6-H
Q5	4-H
Q6	5-G
Q7	5-G

LOADING MOT	TOR C.B.A.
Q1	4-G
Q2	4-G
Q3	4-F
Q4	5-B
Q5	4-F
Q6	4-G
Q7	4-G

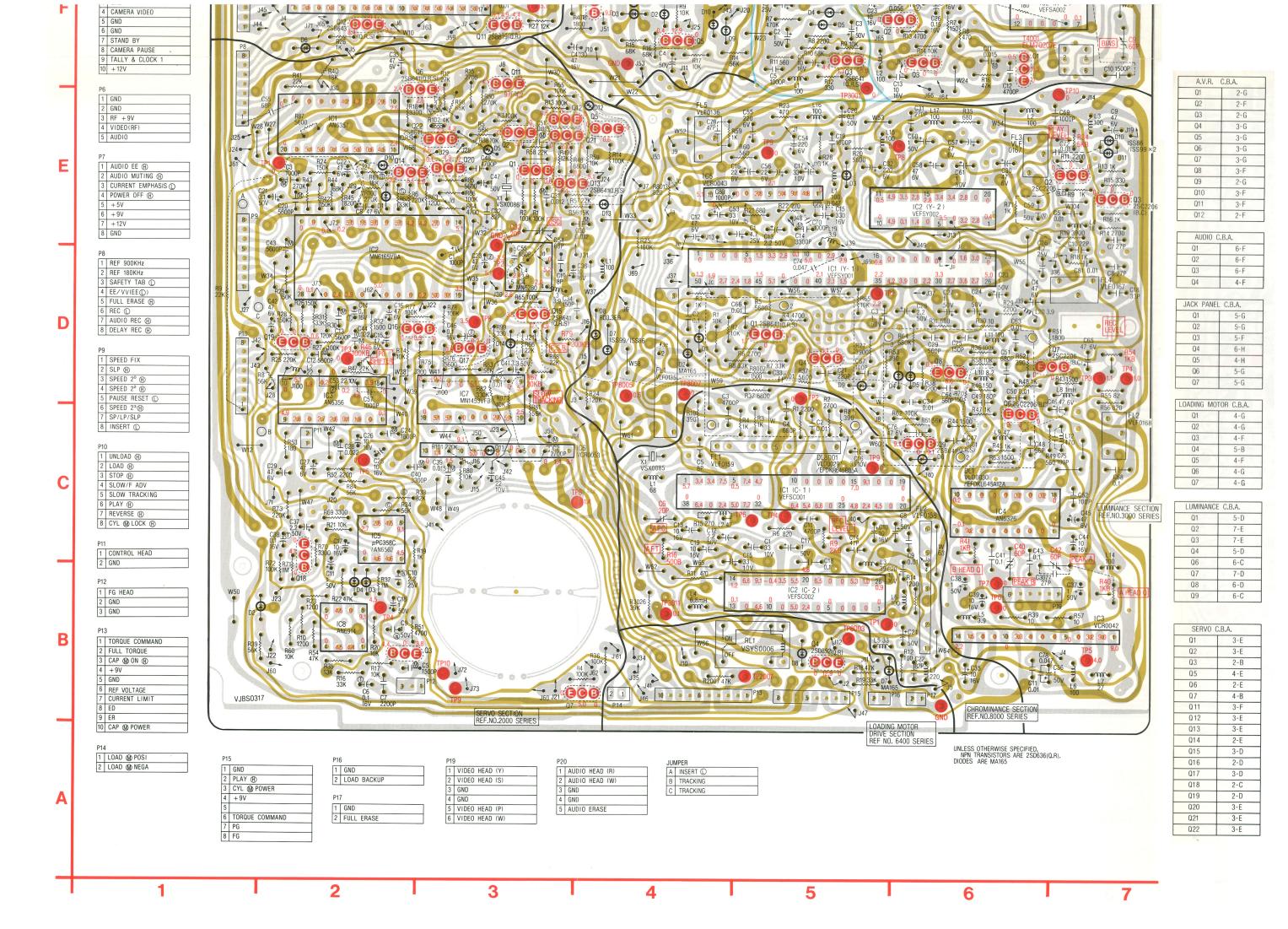
	LUMINANCE	C.B.A.
	Q1	5-D
	Q2	7-E
Ī	Q3	7-E
	Q4	5-D
	Q6	6-C
	Q7	7-D
	Q8	6-D
Ī	Q9	6-C

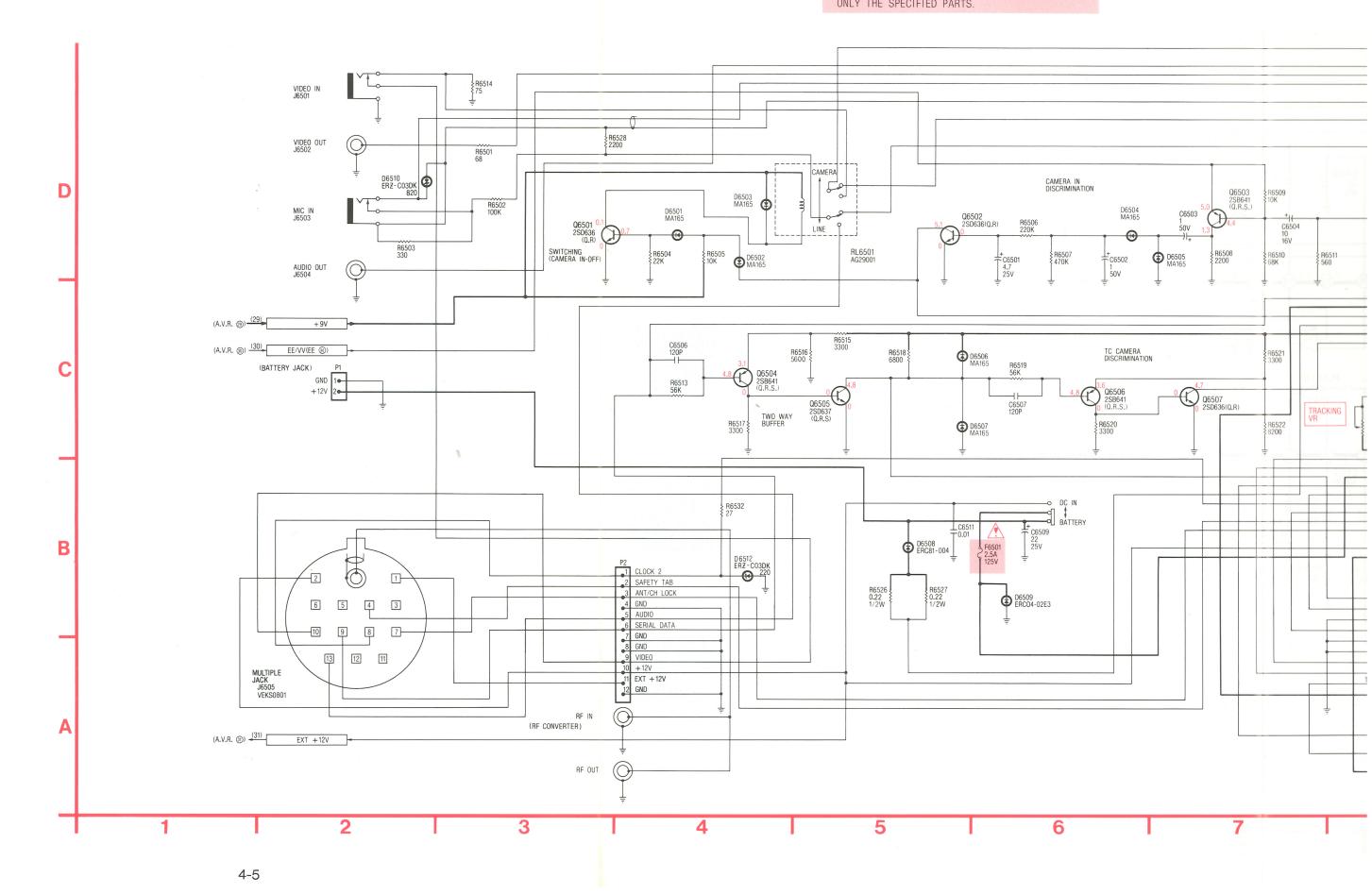
SERVO C	C.B.A.
Q1	3-E
Q2	3-E
Q3	2-B
Q5	4-E
Q6	2-E
Q7	4-B
Q 11	3-F
Q12	3-E
Q13	3-E
Q14	2-E
Q15	3-D
Q16	2-D
Q17	3-D
Q18	2-C
Q19	2-D
Q20	3-E
Q21	3-E
Q22	3-E



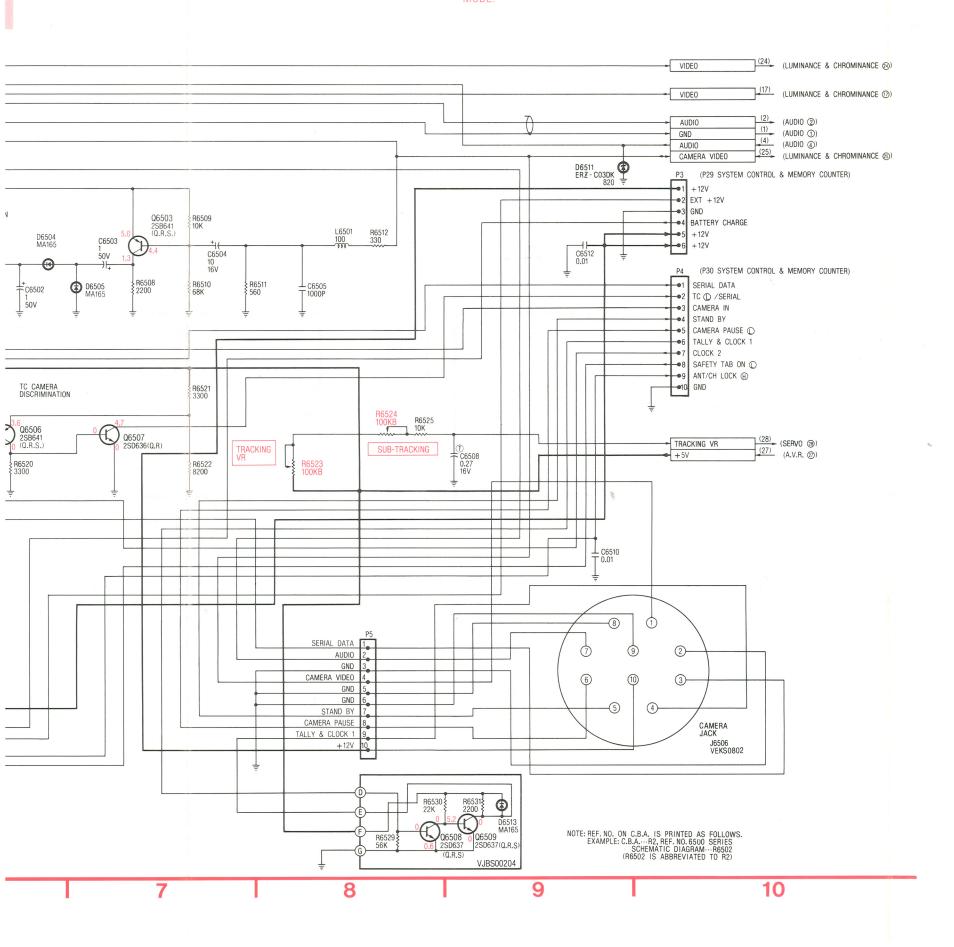


4-4





THE VOLTAGE MEASUREMENTS GIVEN IN THIS DRAWING ARE COLOR BAR SIGNAL IN STOP MODE.



4-5 JACK PANEL SCHEMATIC DIAGRAM

P1 (JACK PANEL C.B.A.)						
PIN NO.	SIGNAL NAME	DESTINATION				
1	GND	BATTERY JACK				
2	+12V	BATTERY JACK				

PIN NO.	SIGNAL NAME	DECTINATION
		DESTINATION
1	CLOCK 2	J6505-8 MULTIPLE JACK
2	SAFETY TAB	J6505-4 MULTIPLE JACK
3	ANT/CH LOCK	J6505-7 MULTIPLE JACK
4	GND	
5	AUDIO	J6505-13 MULTIPLE JACK
6	SERIAL DATA	J6505-9 MULTIPLE JACK
7	GND	
8	GND	
9	VIDEO	J6505-10 MULTIPLE JACK
10	+12V	J6505-2 MULTIPLE JACK
11-	EXT +12V	J6505-1 MULTIPLE JACK
12	GND	

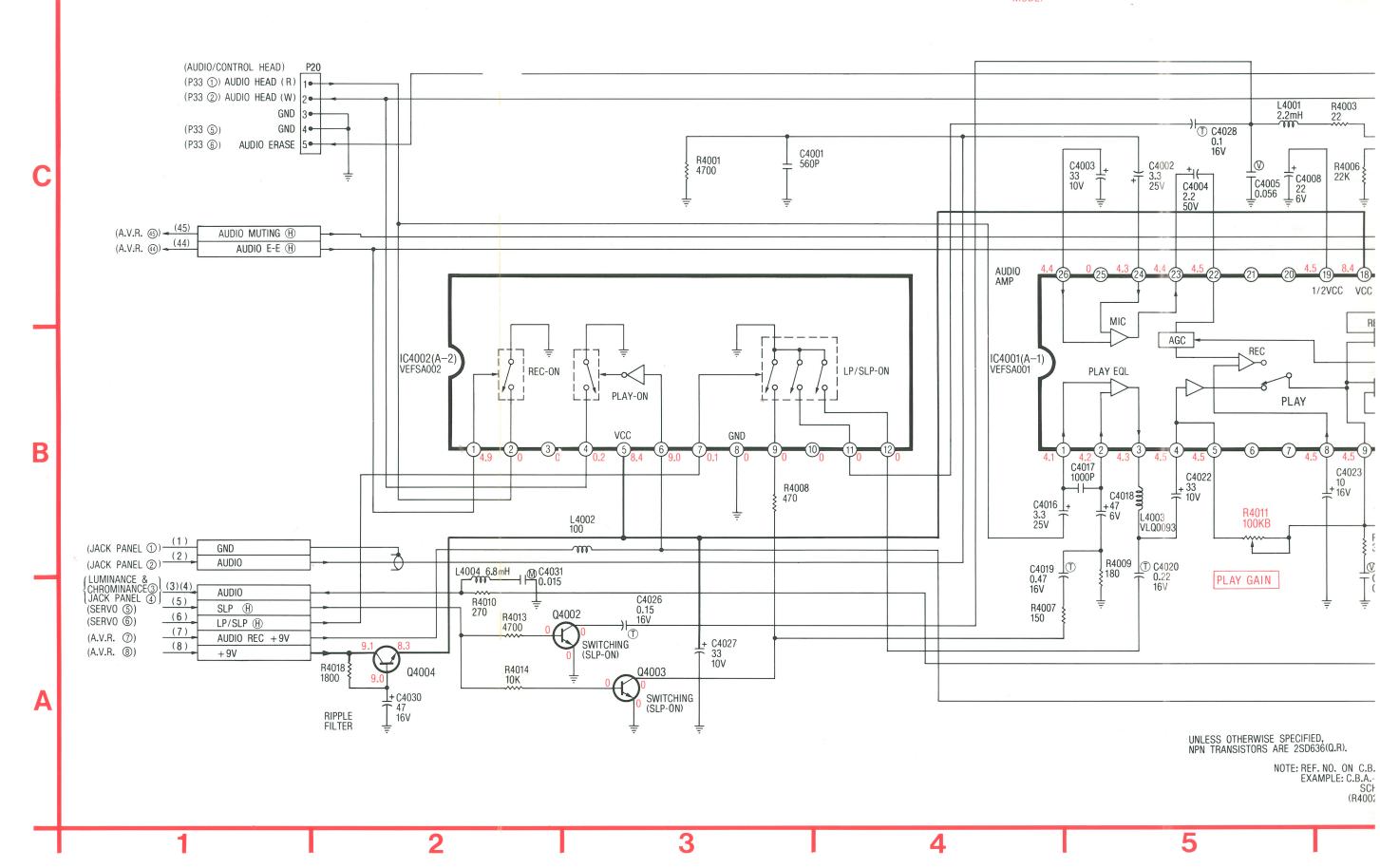
P3 (JACK PANEL C.B.A.)						
PIN NO.	SIGNAL NAME	DESTINATION				
1	+12V	P29-1 SYSTEM CONTROL & MEMORY COUNTER C.B.A.				
2	EXT +12V	P29-5 SYSTEM CONTROL & MEMORY COUNTER C.B.A.				
3	GND	P29-6 SYSTEM CONTROL & MEMORY COUNTER C.B.A.				
4	BATTERY CHARGE	P29-2 SYSTEM CONTROL & MEMORY COUNTER C.B.A.				
5	+12V	P29-3 SYSTEM CONTROL & MEMORY COUNTER C.B.A.				
6	+12V	P29-4 SYSTEM CONTROL & MEMORY COUNTER C.B.A.				

P4 (JACK PANEL C.B.A.)						
PIN NO.	SIGNAL NAME	DESTINATION				
1	SERIAL DATA	P30-6 SYSTEM CONTROL & MEMORY COUNTER C.B.A.				
2	TC () /SERIAL	P30-7 SYSTEM CONTROL & MEMORY COUNTER C.B.A.				
3	CAMERA IN	P30-3 SYSTEM CONTROL & MEMORY COUNTER C.B.A.				
4	STAND BY	P30-10 SYSTEM CONTROL & MEMORY COUNTER C.B.A.				
5	CAMERA PAUSE ①	P30-9 SYSTEM CONTROL & MEMORY COUNTER C.B.A.				
6	TALLY & CLOCK 1	P30-8 SYSTEM CONTROL & MEMORY COUNTER C.B.A.				
7	CLOCK 2	P30-5 SYSTEM CONTROL & MEMORY COUNTER C.B.A.				
8	SAFETY TAB ON ①	P30-4 SYSTEM CONTROL & MEMORY COUNTER C.B.A.				
9	ANT/CH LOCK (H)	P30-2 SYSTEM CONTROL & MEMORY COUNTER C.B.A.				
10						

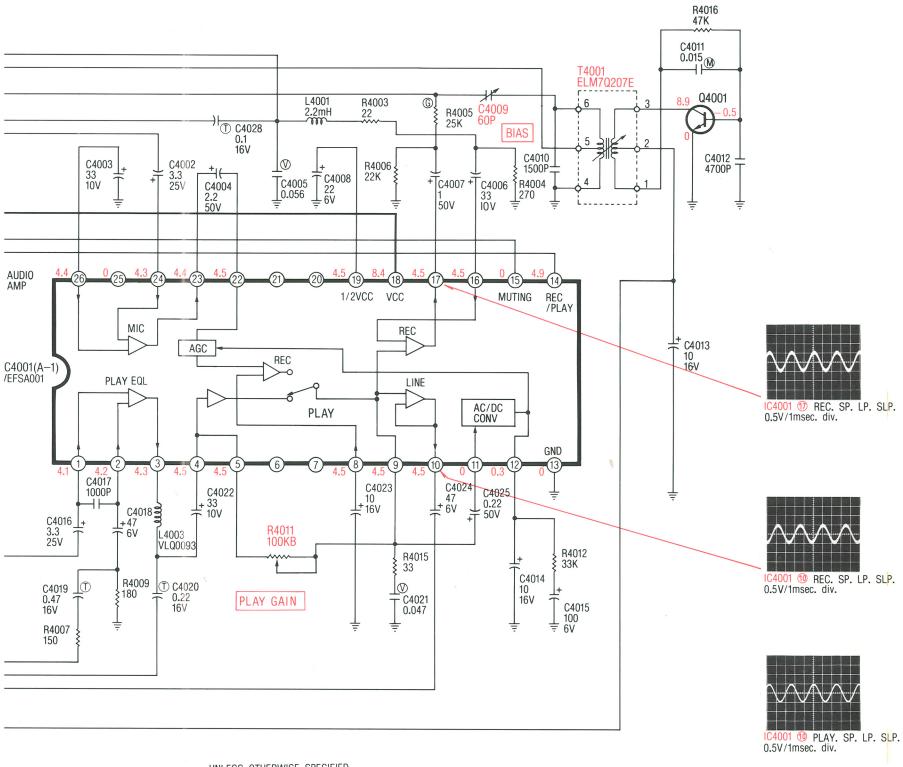
P5 (JACK PANEL C.B.A.)						
PIN NO.	SIGNAL NAME	DESTINATION				
1	SERIAL DATA	J6506-3 CAMERA JACK				
2	AUDIO	J6506-7 CAMERA JACK				
3	GND	J6506-2 CAMERA JACK				
4	CAMERA VIDEO	J6506-1 CAMERA JACK				
5	GND	J6506-8 CAMERA JACK				
6	GND	J6506-9 CAMERA JACK				
7	STAND BY	J6506-5 CAMERA JACK				
8	CAMERA PAUSE	J6506-6 CAMERA JACK				
9	TALLY & CLOCK 1	J6506-4 CAMERA JACK				
10	+12V	J6506-10 CAMERA JACK				

CALLOUTS NEXT TO WIRING PLUGS INDICATE CONNECTIONS TO OTHER SCHEMATIC DIAGRAM.

4-6 AUDIO SCHEMATIC DIAGRAM



## THE VOLTAGE MEASUREMENTS GIVEN IN THIS DRAWING ARE COLOR BAR SIGNAL IN SP-REC MODE.



UNLESS OTHERWISE SPECIFIED, NPN TRANSISTORS ARE 2SD636(Q.R).

NOTE: REF. NO. ON C.B.A. IS PRINTED AS FOLLOWS. EXAMPLE: C.B.A...R2, REF. NO. 4000 SERIES SCHEMATIC DIAGRAM...R4002 (R4002 IS ABBREVIATED TO R2)

5 6 7

P20 (AUDIO C.B.A.)					
PIN NO.	SIGNAL NAME	DESTINATION			
1	AUDIO HEAD (R)	P33-1 AUDIO/CONTROL HEAD C.B.A.			
2	AUDIO HEAD (W)	P33-2 AUDIO/CONTROL HEAD C.B.A.			
3	GND	2			
4	GND	P33-5 AUDIO/CONTROL HEAD C.B.A.			
5	AUDIO ERASE	P33-6 AUDIO/CONTROL HEAD C.B.A.			

## CALLOUTS NEXT TO WIRING PLUGS INDICATE CONNECTIONS TO OTHER SCHEMATIC DIAGRAM.

	STOP				REC			PLAY		
	E.	В	С	E	В	С	E	В	С	
Q4001	0	0.2	0.2	0	-0.5	8.9	0	0.4	0.4	
Q4002	0	0	0	0	0	0	0	0	0	
Q4003	0	0	0	0	0	0	0	0	0	
04004	8.3	9.0	9.1	8.3	9.0	9.1	8.3	9.0	9.1	

PIN N	$^{T}$		IC 4001	
PIN N	υ.	STOP	REC	PLAY
PIN	1	4.0	4.1	4.0
PIN	2	4.2	4.2	4.2
PIN	3	4.3	4.3	4.3
PIN	4	4.5	4.5	4.5
PIN	5	4.5	4.5	4.5
PIN	6	*	*	*
PIN	7	*	*	*
PIN	8	4.5	4.5	4.4
PIN	9	4.5	4.5	4.5
PIN 1	0	4.5	4.5	4.5
PIN 1	1	0	0	0
PIN 1	2	0.3	0.3	0
PIN 1	3	0	0	0
PIN 1	4	5.0	4.9	0
PIN 1	5	0	0	0
PIN 1	6	4.5	4.5	4.5
PIN 1	7	4.5	4.5	4.5
PIN 1	8	8.3	8.4	8.2
PIN 1	9	4.5	4.5	4.5
PIN 2	0	*	*	*
PIN 2	1	*	*	*
PIN 2	2	4.4	4.5	4.4
PIN 2	3	4.3	4.4	4.3
PIN 2	4	4.2	4.3	4.3
PIN 2	5	0	0	0
PIN 2	6	4.3	4.4	4.3

PIN NO.		IC 4002	
FIN NO.	STOP	REC	PLAY
PIN 1	5.0	4.9	0
PIN 2	0	0	0
PIN 3	0	0	0
PIN 4	0	0.2	0
PIN 5	8.3	8.4	8.2
PIN 6	0.2	9.0	0.3
PIN 7	0.1	0.1	0.1
PIN 8	0	0	0
PIN 9	0	0	0
PIN 10	0	0	0
PIN 11	0	0	0
PIN 12	0	0	0

VOLTAGE MEASUREMENTS: COLOR BAR SIGNAL IN SP MODE.

★: UNMEASURABLE OR UNNECESSARY.

4-6

1 GND 2 +12V

1 CLOCK 2 2 SAFETY TAB 3 ANT/CH LOCK 4 GND 5 AUDIO 6 SERIAL DATA

7 GND 8 GND 9 VIDEO 10 + 12V 11 EXT +12V 12 GND

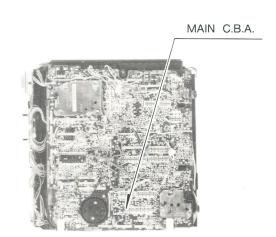
2 EXT +12V

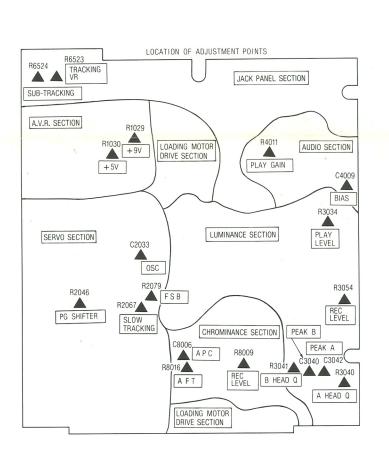
**IMPORTANT SAFETY NOTICE:** 

COMPONENTS IDENTIFIED BY THE SIGN A HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

THE DRAV MOD

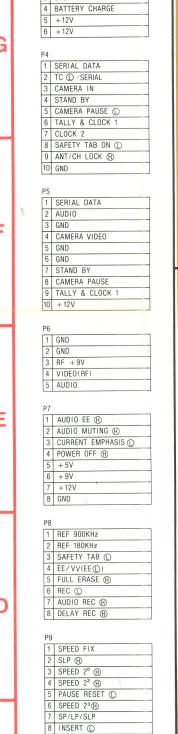
EXC SEC





LOCATION OF TEST POINTS

JACK PANEL SECTION





#### MAIN C.B.A. (VEPS0317A)

1 GND 2 +12V

1 CLOCK 2 2 SAFETY TAB 3 ANT/CH LOCK

5 AUDIO SERIAL DATA

8 GND 9 VIDEO 10 + 12V 11 EXT +12V 12 GND

2 EXT +12V

1 SERIAL DATA

4 STAND BY

CLOCK 2

10 GND

5 GND 6 GND 7 STAND BY

2 GND 3 RF + 9V 4 VIDEO(RE 5 AUDIO

1 AUDIO EE (H)

1 REF 900KHz 2 REF 180KHz

4 EE/VV(EE

8 DELAY REC

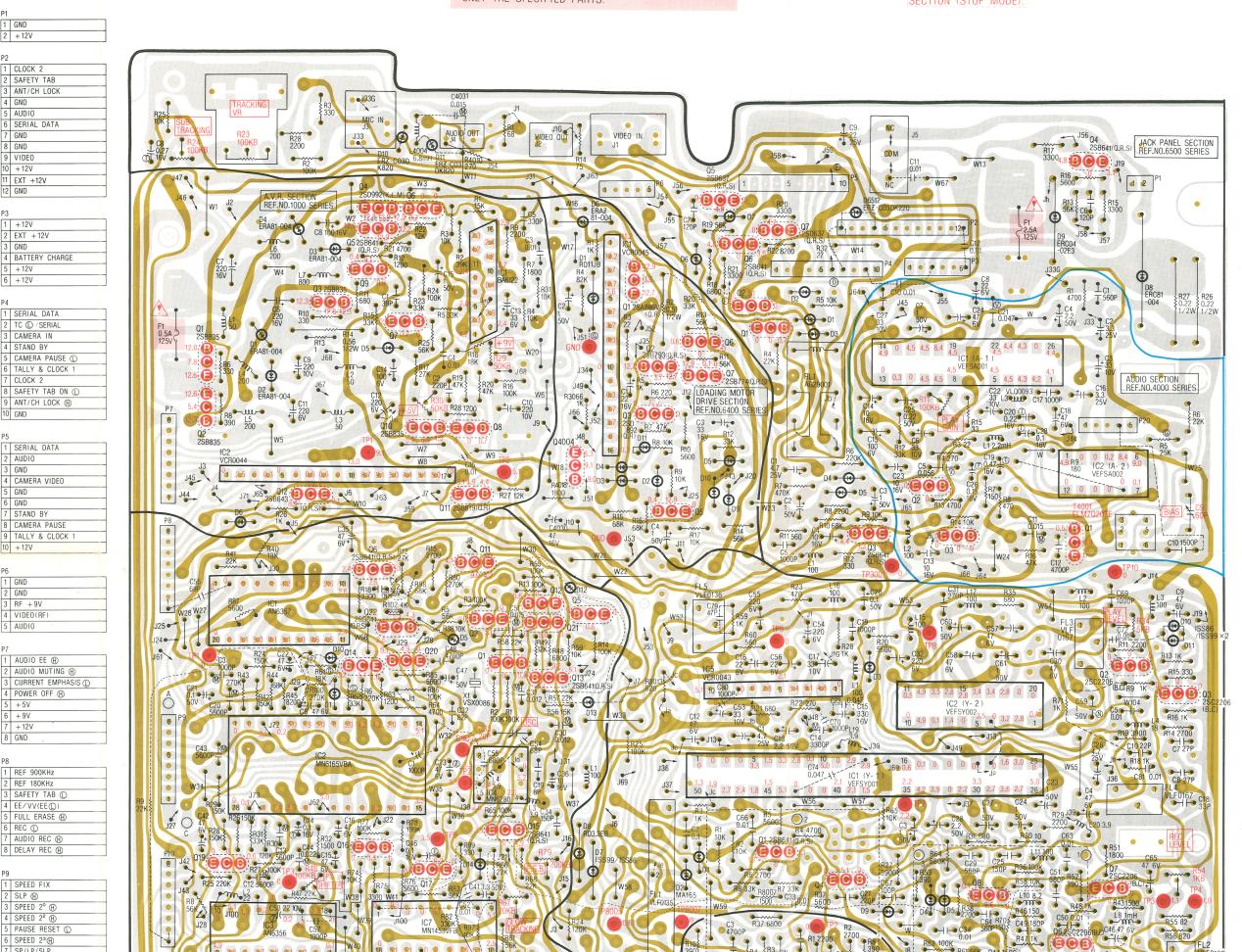
1 SPEED FIX 3 SPFFD 2° SPEED 22

SPEED 23(F 7 SP/LP/SLF

5 + 5V 6 + 9V + 12V 8 GND

IMPORTANT SAFETY NOTICE: COMPONENTS IDENTIFIED BY THE SIGN A HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

THE VOLTAGE MEASUREMENTS GIVEN IN THIS DRAWING ARE COLOR BAR SIGNAL IN SP-REC EXCEPT A.V.R. SECTION AND JACK PANEL SECTION (STOP MODE).



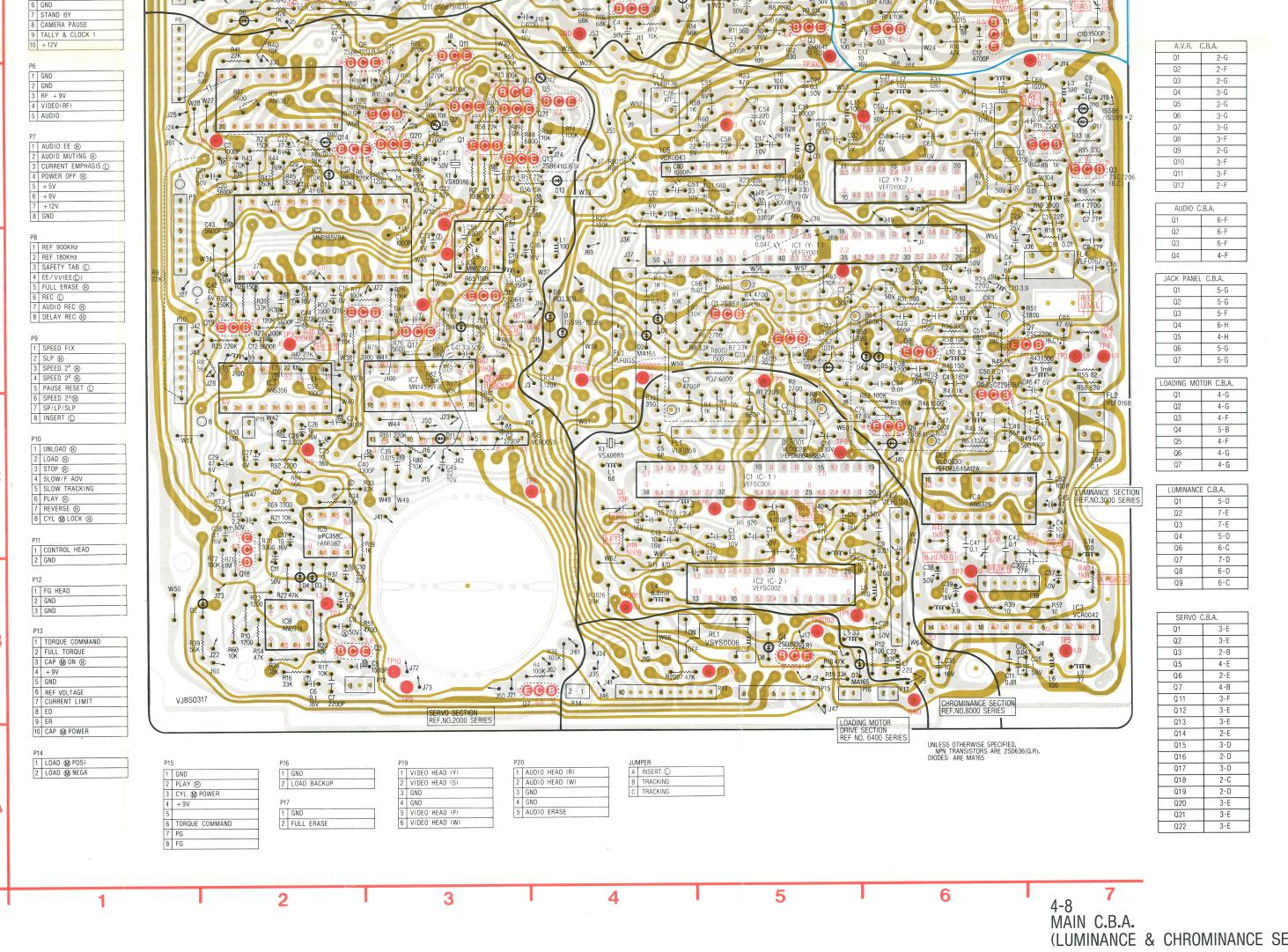
2-G 2-F 2-G 3-G
2-G 3-G
3-G
3-G
0 0
3-G
3-G
3-F
2-G
3-F
3-F
2-F

A.V.R. C.B.A.

AUDIO C.B.A.			
Q1	6-F		
Q2	6-F		
Q3	6-F		
Q4	4-F		

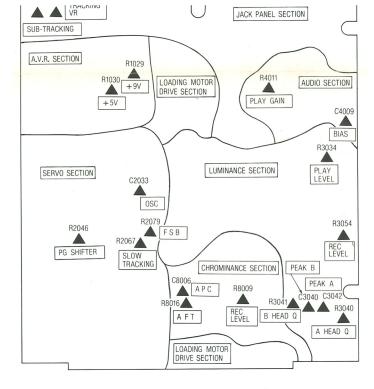
	JACK PANEL C.B.A.				
	Q1	5-G			
	Q2	5-G			
	Q3	5-F			
	Q4	6-H			
	Q5	4-H			
	Q6	5-G			
	Q7	5-G			
_					

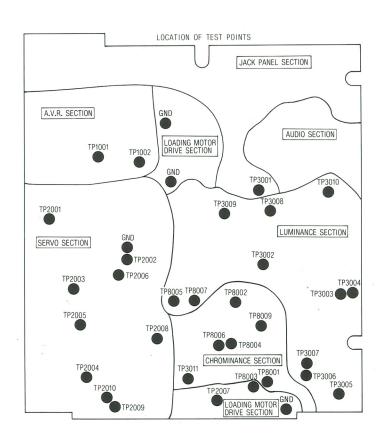
OADING	MOT	TOR	C.B.A.	
Q1			4-G	
Q2			4-G	
Q3			4-F	



D

(LUMINANCE & CHROMINANCE SECTION)







# MAIN C.B.A. (VEPS0317A)

IMPORTANT SAFETY NOTICE:
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SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY.
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ONLY THE SPECIFIED PARTS.

THE VOLTAGE MEASUREMENTS GIVEN IN THIS DRAWING ARE COLOR BAR SIGNAL IN SP-REC

EXCEPT A.V.R. SECTION AND JACK PANEL SECTION (STOP MODE).



1 +12V 2 EXT +12V BATTERY CHARGE

11 EXT +12V

12 GND

G

1 SERIAL DATA TC ( SERIAL CAMERA IN STAND BY CAMERA PAUSE ( TALLY & CLOCK 1 CLOCK 2 SAFETY TAB ON ( 9 ANT/CH LOCK (A) 10 GND

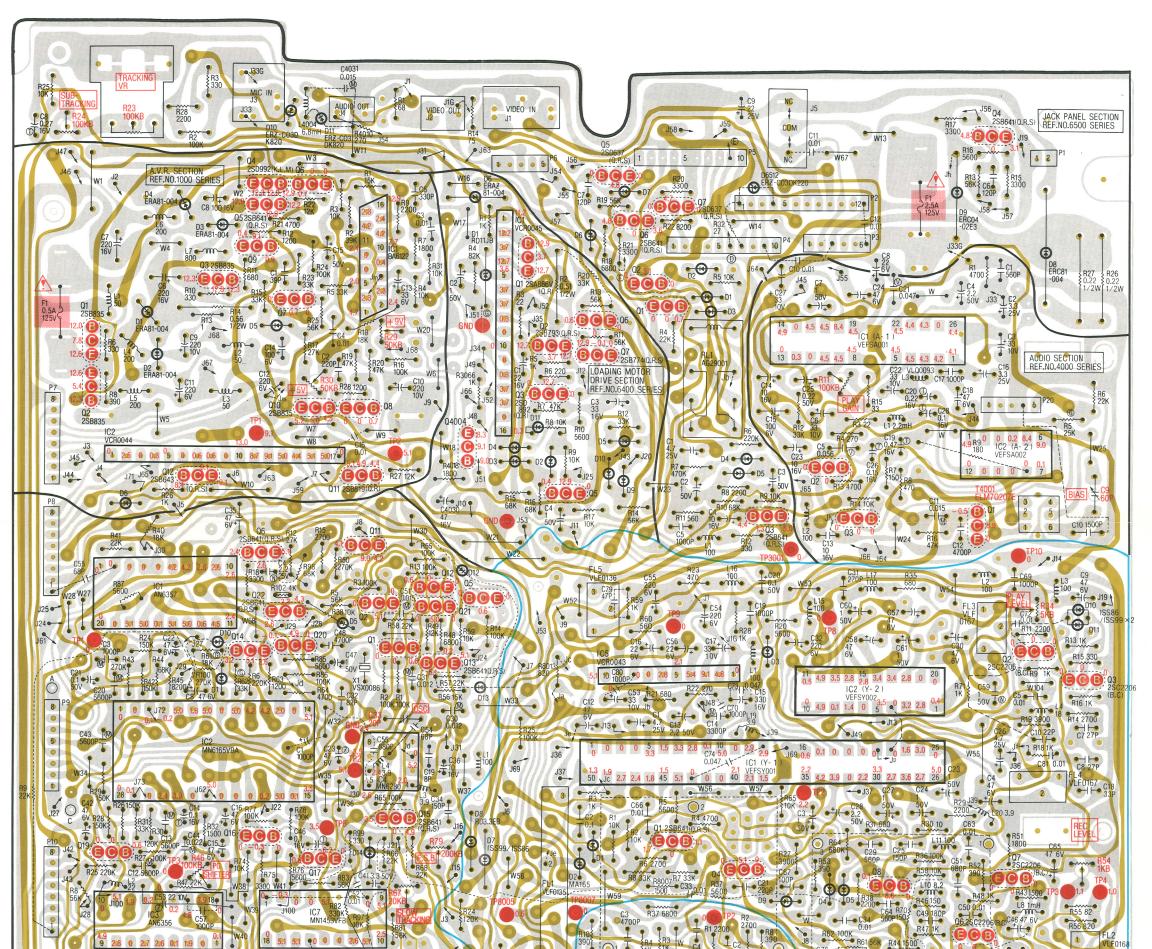
1 SERIAL DATA 2 AUDIO CAMERA VIDEO STAND BY 8 CAMERA PAUSE 9 TALLY & CLOCK 1 10 + 12V

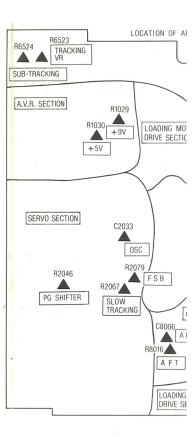
1 GND 2 GND 3 RF +9V VIDEO(RF) 5 AUDIO

1 AUDIO EE (H) AUDIO MUTING (B) CURRENT EMPHASIS POWER OFF (H) 6 +9V 7 +12V 8 GND

Р8	
1	REF 900KHz
2	REF 180KHz
3	SAFETY TAB (
4	EE/VV(EE())
5	FULL ERASE (H)
6	REC ①
7	AUDIO REC (H)
8	DELAY REC (H)

DO.	
P9	
1	SPEED FIX
2	SLP (H)
3	SPEED 2° (H)
4	SPEED 2º (H)
5	PAUSE RESET ①
6	SPEED 2³⊕
7	SP/LP/SLP
8	INSERT ()





A.V.R.	C.B.A.
Q1	2-G
Q2	2-F
Q3	2-G
Q4	3-G
Q5	3-G
Q6	3-G
Q7	3-G
Q8	3-F
Q9	2-G
Q10	3-F
Q <mark>1</mark> 1	3-F
Q12	2-F

AUDIO	C.B.A.
Q1	6-F
Q2	6-F
Q3	6-F
Q4	4-F

JACK PANEL	C.B.A.
Q1	5-G
Q2	5-G
Q3	5-F
Q4	6-H
Q5	4-H
Q6	5-G
Q7	5-G

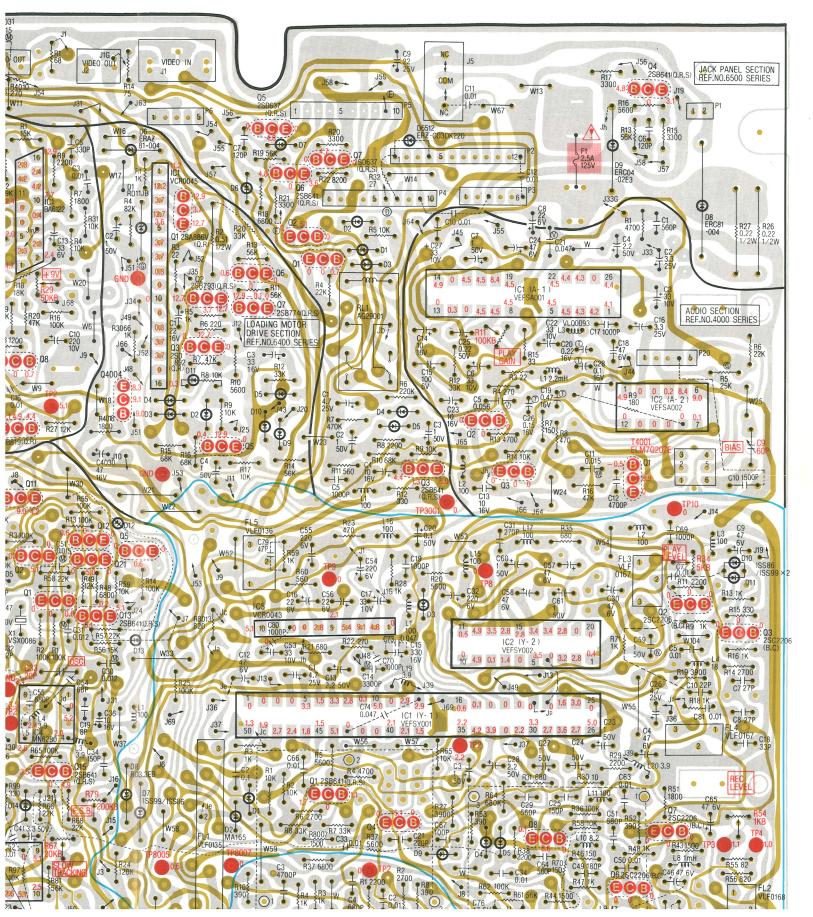
PIN 1 PIN 2 PIN 3 PIN 4 PIN 5 PIN 6 PIN 7 PIN 8 PIN 9 PIN 10 PIN 11 PIN 12 PIN 13 PIN 15 PIN 16 PIN 17 PIN 17 PIN 18 PIN 18

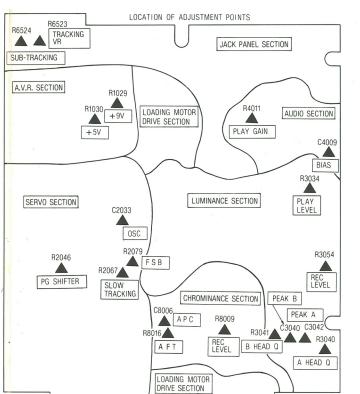
OADING.	MOTOR	C.B.A.	Ī
Q1		4-G	
02		4-G	_

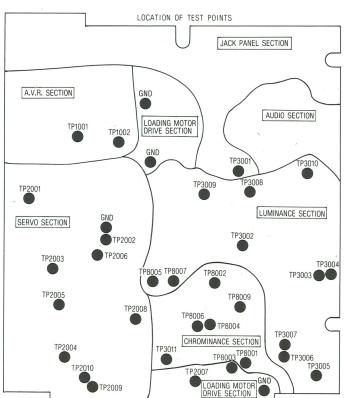
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EXCEPT A.V.R. SECTION AND JACK PANEL SECTION (STOP MODE).







# MAIN C.B.A.

**VOLTAGE MEASUREMENTS:** 

1. CUE, REVIEW.

COLOR BAR SIGNAL IN SLP MODE

COLOR BAR SIGNAL IN SP MODE.

★: UNMEASURABLE OR UNNECESSARY.

Q1	2-G	
Q2	2-F	
Q3	2-G	
Q4	3-G	
Q5	3-G	
Q6	3-G	
Q7	3-G	
Q8	3-F	
Q9	2-G	
Q10	3-F	
Q11	3-F	
Q12	2-F	

A.V.R. C.B.A.

AUDIO C	.B.A.
Q1	6-F
Q2	6-F
Q3	6-F
Q4	4-F

JACK	PANEL	C.B.A.
Q1		5-G
Q2		5-G
Q3		5-F
Q4		6-H
Q5		4-H
Q6		5-G
Q7		5-G

LOADING	MOTOR	C.B.A.
Q1		4-G
02		1-G

	STOP REC			PLAY			CUE			REV					
	Е	В	С	E	В	С	Е	В	С	Е	В	С	E	В	С
Q3001	1.7	1.0	1.7	1.7	1.1	0	0	2.1	1.7	0	2.1	1.7	0	2.1	1.7
Q3002	0.5	1.2	4.0	0	0	0	0.5	1.2	4.0	0.5	1.2	4.1	0.5	1.2	4.1
Q3003	1.2	2.0	3.7	0	0	0	1.2	2.0	3.7	1.2	2.0	3.7	1.2	2.0	3.7
Q3004	0	0	5.0	0	0	5.1	0	0	5.0	0	0	4.9	0	0	4.9
Q3006	1.0	1.7	4.0	0	0	0	1.0	1.7	4.0	1.0	1.7	4.0	1.0	1.7	4.0
Q3007	2.5	3.2	5.0	0	0	0	2.5	3.2	5.0	2.5	3.2	5.0	2.5	3.2	5.0
03008	4.5	4.5	5.8	0.1	0	6.6	4.5	4.9	5.8	4.5	0	5.7	4.5	4.9	5.7
Q3009	9.1	9.1	0	9.1	9.1	0	9.1	9.1	0 ,	9.1	9.0	0	9.1	9.0	0

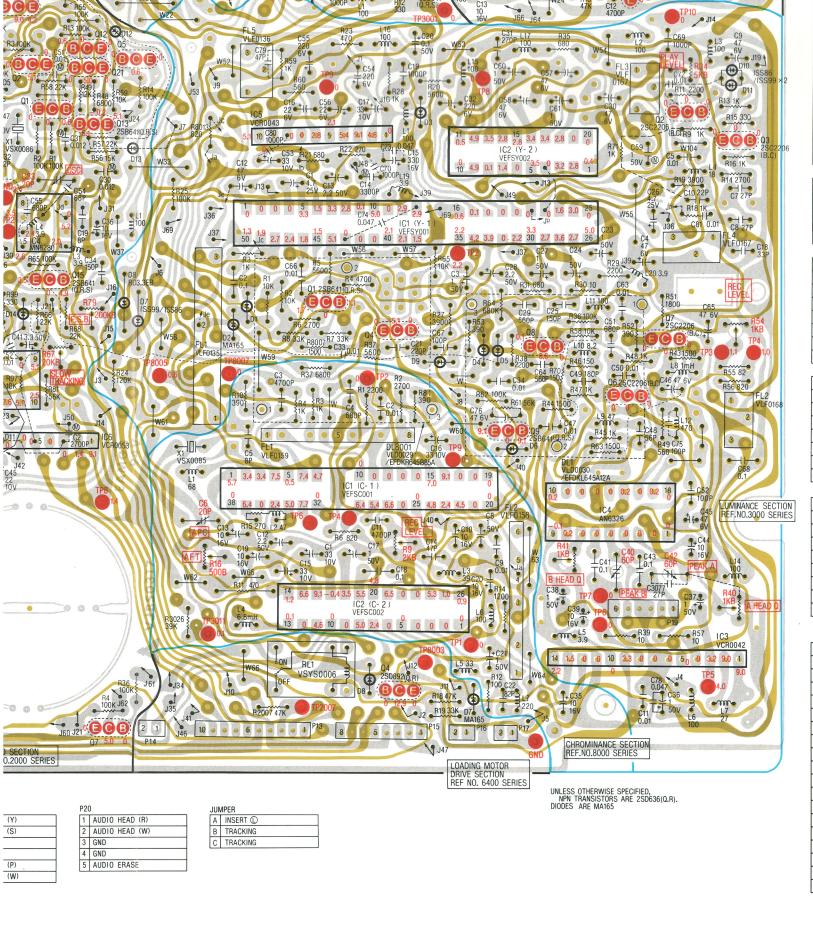
PIN NO.			10 3001				
FIN NO.	STOP	REC	PLAY	CUE	REV		
PIN 1	0	0	0	0	0		
PIN 2	0	0	0	0	0		
PIN 3	3.5	0	3.5	3.5	3.4		
PIN 4	1.0	0	1.1	1.1	1.1		
PIN 5	3.2	3.3	3.2	3.2	3.2		
PIN 6	1.5	1.5	0.6	0.6	0.7		
PIN 7	3.3	3.3	3.3	3.3	3.3		
PIN 8	2.8	2.8	2.8	2.8	2.8		
PIN 9	0	0.1	0	0.1	0.1		
PIN 10	5.0	5.0	5.1	5.0	5.0		
PIN 11	0	0	0	0	0		
PIN 12	2.9	2.9	3.3	3.3	3.3		
PIN 13	2.9	2.9	2.6	2.6	2.6		
PIN 14	*	*	*	*	*		
PIN 15	*	*	*	*	*		
PIN 16	0.6	0.6	1.7	1.7	1.7		
PIN 17	0.1	0.1	4.1	4.2	4.1		
PIN 18	0.5	0	0.5	0.5	0.5		
PIN 19	0	0	0	0	0		
PIN 20	n	n	n	n	n		

PIN NO.		IC 3003							
		STOP	REC	PLAY	CUE	REV			
PIN	1	0.5	9.0	0.3	0.3	0.3			
PIN	2	0.5	9.0	0.3	0.3	0.4			
PIN	3	0	3.2	0	0	0			
PIN	4	0	0	0	0	0			
PIN	5	4.9	0	4.9	4.9	4.9			
PIN	6	0	0	0	0	0			
PIN	7	0	0	0	0	0			
PIN	8	0	0	0	0	0			
PIN	9	3.3	3.3	0.1	C.1	0.1			
PIN 1	0	0	0	0	0	0			
PIN 1	1	0	0	0	0	0			
PIN 1	2	0	0	0	0	0			
PIN 1	3	0.6	1.5	0.3	0.3	0.3			
PIN 1	4	0.6	2.2	0.3	0.3	0.3			

DIM	NO.			IC 3004		
FIIN	140.	STOP	REC	PLAY	CUE	REV
PIN	1 1	4.9	0	4.9	4.9	4.9
PIN	1 2	n	Λ	n	n	2.5

PIN	MO			10 0001		
FIN	NU.	STOP	REC	PLAY	CUE	REV
PIN	1	5.5	5.7	5.7	5.7	5.7
PIN	2	3.4	3.4	3.4	3.4	3.4
PIN	3	3.4	3.4	3.4	3.4	3.4
PIN	4	7.4	7.5	7.5	7.5	7.5
PIN	5	0.6	0.5	0.5	0.5	0.5
PIN	6	7.4 -	7.4	7.4	7.4	7.4
PIN	7	4.7	4.7	4.7	4.7	4.7
PIN	8	*	*	*	*	*
PIN	9	*	*	*	*	*
PIN	10	0	0	0	0	0
PIN	11	0	0	0	0	0
PIN	12	0	0	0	0	0
PIN	13	0	0	0	0	0
PIN	14	0.1	0	0.1	4.2	4.2
PIN	15	7.0	7.0	7.0	7.0	7.0
PIN	16	9.1	9.1	9.1	9.1	9.1
PIN	17	0	0	0	0	0
PIN	18	0	0	0	0	0
PIN	19	0	0	0	0	0
DIM	ാറ	n	Λ	n	n	n

IC 8001



5

A.V.R.	C.B.A.	
Q1	2-G	
Q2	2-F	
Q3	2-G	
Q4	3-G	
Q5	3-G	
Q6	3-G	
Q7	3-G	
Q8	3-F	
Q9	2-G	
Q10	3-F	
Q11	3-F	
Q12	2-F	
1	-	

AUDIO	C.B.A.
Q1	6-F
Q2	6-F
Q3	6-F
Q4	4-F

JACK PANEL	C.B.A.
Q1	5-G
Q2	5-G
Q3	5-F
Q4.	6-H
Q5	4-H
Q6	5-G
Q7	5-G

LOADING MO	TOR C.B.A.
Q1	4-G
Q2	4-G
Q3	4-F
Q4	5-B
Q5	4-F
Q6	4-G
Q7	4-G
Q5 Q6	4-F 4-G

LUMINANC	E C.B.A.
Q1	5-D
Q2	7-E
Q3	7-E
Q4	5-D
Q6	6-C
Q7	7-D
Q8	6-D
Q9	6-C

SERVO C.B.A.

Q1	3-E
Q2	3-E
Q3	2-B
Q5	4-E
Q6	2-E
Q.7	4-B
Q 11	3-F
Q12	3-E
Q1 <mark>3</mark>	3-E
Q1 4	2-E
Q1 <mark>5</mark>	3-D
Q16	2-D
Q1 <mark>7</mark>	3-D
Q18	2-C
Q19	2-D
Q2 <mark>0</mark>	3-E
Q2 <mark>1</mark>	3-E
Q2 <mark>2</mark>	3-E



		STOP REC			PLAY			CUE			REV				
	Е	В	С	E	В	С	Е	В	С	Е	В	С	Е	В	С
Q3001	1.7	1.0	1.7	1.7	. 1.1	0	0	2.1	1.7	0	2.1	1.7	0	2.1	1.7
Q3002	0.5	1.2	4.0	0	0	0	0.5	1.2	4.0,	0.5	1.2	4.1	0.5	1.2	4.1
Q3003	1.2	2.0	3.7	0	0	0	1.2	2.0	3.7	1.2	2.0	3.7	1.2	2.0	3.7
Q3004	0	0	5.0	0	0	5.1	0	0	5.0	0	0	4.9	0	0	4.9
Q3006	1.0	1.7	4.0	0	0	0	1.0	1.7	4.0	1.0	1.7	4.0	1.0	1.7	4.0
Q3007	2.5	3.2	5.0	0	0	0	2.5	3.2	5.0	2.5	3.2	5.0	2.5	3.2	5.0
Q3008	4.5	4.5	5.8	0.1	0	6.6	4.5	4.9	5.8	4.5	0	5.7	4.5	4.9	5.7
Q3009	9.1	9.1	0	9.1	9.1	0	9.1	9.1	0	9.1	9.0	0	9.1	9.0	0

PIN NO.			IC 3001		
riN NU.	STOP	REC	PLAY	CUE	REV
PIN 1	0	0	0	0	0
PIN 2	0	0	0	0	0
PIN 3	3.5	0	3.5	3.5	3.4
PIN 4	1.0	0	1.1	1.1	1.1
PIN 5	3.2	3.3	3.2	3.2	3.2
PIN 6	1.5	1.5	0.6	0.6	0.7
PIN 7	3.3	3.3	3.3	3.3	3.3
PIN 8	2.8	2.8	2.8	2.8	2.8
PIN 9	0	0.1	0	0.1	0.1
PIN 10	5.0	5.0	5.1	5.0	5.0
PIN 11	0	0	0	0	0
PIN 12	2.9	2.9	3.3	3.3	3.3
PIN 13	2.9	2.9	2.6	2.6	2.6
PIN 14	*	*	*	*	*
PIN 15	*	*	*	*	*
PIN 16	0.6	0.6	1.7	1.7	1.7
PIN 17	0.1	0.1	4.1	4.2	4.1
PIN 18	0.5	0	0.5	0.5	0.5
PIN 19	0	0	0	0	0
PIN 20	0	0	0	0	0
PIN 21	4.1	0	4.1	4.0	4.1
PIN 22	2.5	0	2.5	2.5	2.5
PIN 23	1.3	1.6	1.3	1.3	1.3
PIN 24	2.9	3.0	3.0	3.0	3.0
PIN 25	0.5	0	0.5	0.5	0.5
PIN 26	4.9	5.0	4.9	4.9	4.9
PIN 27	2.6	2.7	2.6	2.6	2.6
PIN 28	3.5	3.6	3.4	3.4	3.5
PIN 29	2.7	2.7	2.7	2.6	2.6
PIN 30	3.2	3.3	0	3.1	3.1
PIN 31	2.1	2.2	2.1	2.1	2.1
PIN 32	0	0	0	0	0
PIN 33	3.8	3.9	3.8	3.8	3.8
PIN 34	2.2	4.2	0.1	0.1	0.1
PIN 35	2.1	2.2	1.9	1.9	1.9
PIN 36	*	*	*	*	*
PIN 37	*	*	*	*	*
PIN 38	1.5	1.5	1.7	1.5	1.5
PIN 39	2.0	2.1	1.9	1.9	1.9
PIN 40	2.1	2.1	2.1	2.1	2.1
PIN 41	0	0	0	0	0
PIN 42	0	0	0	0	0
PIN 43	0	0	0	0	0
PIN 44	5.0	5.1	5.0	5.0	5.0
PIN 45	1.5	1.5	1.5	1.5	1.5
PIN 46	1.7	1.8	1.7	1.7	1.7
PIN 47	2.4	2.4	2.3	2.3	2.3
PIN 48	2.7	2.7	2.7	2.7	2.7
PIN 49	1.9	1.9	1.9	1.9	1.9
PIN 50	1.3	1.3	1.3	1.3	1.3

PIN NO. STOP REC PLAY CUE
PIN 1 0.4 0 0.4 0.4
PIN 2 2.8 0 2.8 2.8

PIN NO.	IC 3003								
1114 140.	STOP	REC	PLAY	CUE	RE				
PIN 1	0.5	9.0	0.3	0.3	0.3				
PIN 2	0.5	9.0	0.3	0.3	0.4				
PIN 3	0	3.2	0	0	0				
PIN 4	0	0	0	0	0				
PIN 5	4.9	0	4.9	4.9	4.9				
PIN 6	0	0	0	0	0				
PIN 7	0	0	0	0	0				
PIN 8	0	0	0	0	0				
PIN 9	3.3	3.3	0.1	0.1	0.1				
PIN 10	0	0	0	0	0				
PIN 11	0	0	0	0	0				
PIN '12	0	0	0	0	0				
PIN 13	0.6	1.5	0.3	0.3	0.3				
PIN 14	0.6	2.2	0.3	0.3	0.3				

				0.0	0.0	0.0
		7				
PIN	NO			IC 3004		
FIIV	NO.	STOP	REC	PLAY	CUE	REV
PIN	1	4.9	0	4.9	4.9	4.9
PIN	2	0	0	0	0	2.5
PIN	3	0.8	0	0.8	0.8	0.8
PIN	4	0.7	0	0.7	0.7	0.7
PIN	5	0	0	0	0	0
PIN	6	0.7	0	0.7	0.6	0.7
PIN	7	0.8	0	0.8	0.8	0.8
PIN	8	3.2	0.2	3.2	3.1	3.1
PIN	9	3.3	-0.1	3.3	3.2	3.2
PIN	10	2.8	0	2.8	2.8	2.8
PIN	11	3.1	0.2	3.1	3.1	3.1
PIN	12	1.7	0	1.7	1.7	1.6
PIN	13	3.2	0.2	3.2	3.2	3.2
PIN	14	0	0	0	0	0
PIN	15	4.5	0	0	4.5	4.5
PIN	16	3.4	0	3.3	3.2	3.2
PIN	17	3.2	0	0	3.2	3.2
PIN	18	3.2	0.2	3.2	3.2	3.2

PIN N	^			IC 3005		
FIN N	υ.	STOP	REC	PLAY	CUE	REV
PIN	1	0	0	0	0	0
PIN :	2	4.8	4.8	4.7	4.7	4.7
PIN :	3	9.1	9.1	9.1	9.1	9.1
PIN -	4	5.4	5.4	5.4	5.4	5.4
PIN :	5	2.1	2.1	2.1	2.1	2.1
PIN	6	2.8	2.8	2.7	2.7	2.7
PIN	7	0	0	9.0	3.4	9.0
PIN :	8	0	0	8.4	8.4	8.4
PIN !	9	0	0	7.0	7.0	7.0
PIN 1	0	5.0	5.1	0	0	0

PIN NO.			IC 3002			TP NO.	TP NO.	STOP	REC	PLAY	CUE	F
FIN NU.	STOP	REC	PLAY	CUE	REV	TP3001	TP3001	0	0	7.0	6.9	1
PIN 1	0.4	0	0.4	0.4	0.4	TP3002	TP3002	2.2	2.2	1.9	0	
PIN 2	2.8	0	2.8	2.8	2.8	TP3003	TP3003	1.1	1.1	1.3	1.3	
PIN 3	3.2	0.2	3.2	3.2	3.2	TP3004	TP3004	1.0	1.0	1.2	0	
_PIN 4	0	0	0	0	0	TP3005	TP3005	0	4.0	0	0	(
PIN 5	3.5	0	3.5	3.5	3.4	TP3006	TP3006	0	0	0	0	(
PIN 6	0	0	0	0	0	TP3007	TP3007	0	0	0	0	(
PIN 7	1.4	0	1.4	1.4	1.4	TP3008	TP3008	2.1	0	3.4	3.4	3
PIN 8	0	0	0.1	0.1	0.1	TP3009	TP3009	0	0	0	0	(
PIN 9	4.9	0	4.9	4.8	4.8	TP3010	TP3010	5.0	0	0	0	(
PIN 10	0	0	0	0	0	TP3011	TP3011	3.2	0.1	0.1	0.1	
PIN 11	0.5	0	0.5	0.4	0.4							
PIN 12	4.9	0	4.9	4.9	4.9							
PIN 13	2.1	0	3.5	3.4	3.4	TP NO.	TP NO.	STOP	REC	PLAY	CUE	R
PIN 14	2.8	0	2.8	2.7	2.8	TP8001	TP8001	5.0	0	5.0	5.0	5
PIN 15	2.8	0	2.8	2.8	2.8	TP8002	TP8002	0	0	0	0	0
PIN 16	3.4	0	3.4	3.4	3.4	TP8005	TP8005	0.7	0.6	0.7	0.7	0
PIN 17	3.4	0	3.4	3.4	3.4	TP8007	TP8007	0	0	0	0	0
PIN 18	2.8	0	2.8	2.7	2.8	TP8009	TP8009	0	0	0	0	0
PIN 19	0	0	0	0	0							
PIN 20	0	0	n	n	0							

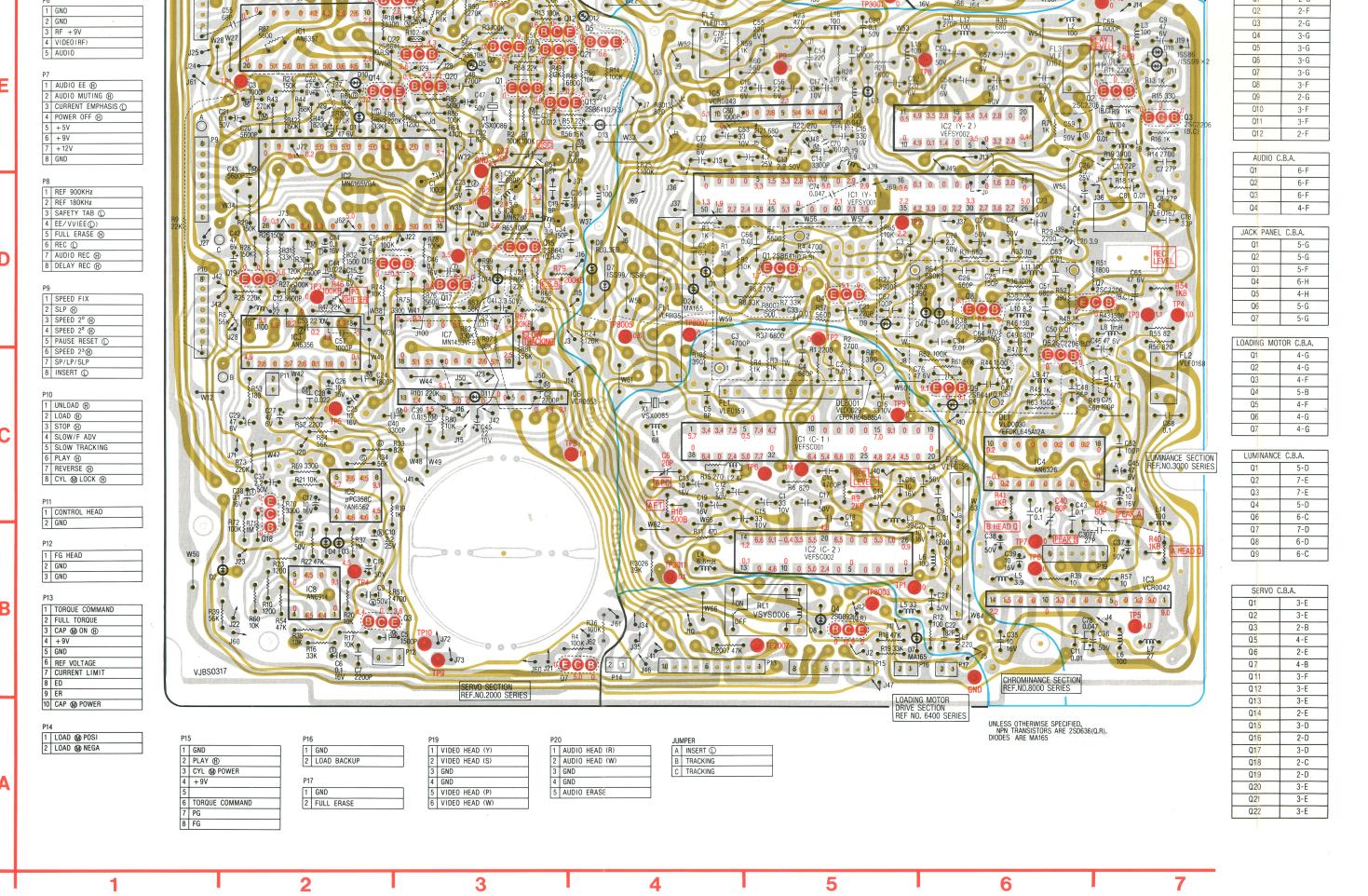
PIN NO.			IC 8001		
	STOP	REC	PLAY	CUE	REV
PIN 1	5.5	5.7	5.7	5.7	5.7
PIN 2	3.4	3.4	3.4	3.4	3.4
PIN 3	3.4	3.4	3.4	3.4	3.4
PIN 4	7.4	7.5	7.5	7.5	7.5
PIN 5	0.6	0.5	0.5	0.5	0.5
PIN 6	7.4 -	7.4	7.4	7.4	7.4
PIN 7	4.7	4.7	4.7	4.7	4.7
PIN 8	*	*	*	*	*
PIN 9	*	*	*	*	*
PIN 10	0	0	0	0	0
PIN 11	0	0	0	0	0
PIN 12	0	0	0	0	0
PIN 13	0	0	0	0	0
PIN 14	0.1	0	0.1	4.2	4.2
PIN 15	7.0	7.0	7.0	7.0	7.0
PIN 16	9.1	9.1	9.1	9.1	9.1
PIN 17	0	0	0	0	0
PIN 18	0	0	0	0	0
PIN 19	0	0	0	0	0
PIN 20	0	0	0	0	0
PIN 21	0	0	0	0	0
PIN 22	4.5	4.5	4.6	4.6	4.5
PIN 23	2.4	2.4	2.5	2.6	2.6
PIN 24	4.9	4.8	4.9	4.9	4.9
PIN 25	0	0	0	0	0
PIN 26	0	0	0	0	0
PIN 27	5.8	6.6	5.8	5.7	5.7
PIN 28	5.1	5.0	5.1	5.1	5.0
PIN 29	6.4	6.4	6.4	6.4	6.4
PIN 30	*	*	*	*	*
PIN 31	*	*	*	*	*
PIN 32	0	0	0	0	0
PIN 33	7.7	7.7	7.7	7.6	7.6
PIN 34	4.9	5.0	5.0	5.0	5.0
PIN 35	1.3	2.4	2.4	2.3	2.3
PIN 36	0	0	0	0	0
PIN 37	6.4	6.4	6.4	6.4	6.4
PIN 38	0	0	0	0	0

PIN NO.	STOP	REC	PLAY	CUE	REV
PIN 1	4.9	0	5.0	5.0	5.0
PIN 2	5.0	0	5.0	5.0	5.0
PIN 3	3.2	0	3.3	3.3	3.3
PIN 4	0	0	0	0	0
PIN 5	0	0	0	0	0
PIN 6	5.0	0	0	0	0
PIN 7	2.4	2.4	2.5	2.6	2.6
PIN 8	5.0	5.0	5.0	5.0	5.0
PIN 9	0	0	0	0	0
PIN 10	0	0	0	0	0
PIN 11	4.5	4.6	4.6	4.6	0
PIN 12	0	0	0	0	0
PIN 13	0.1	0.1	0.1	0.1	0.1
PIN 14	1.2	1.2	1.2	1.2	1.2
PIN 15	6.6	6.6	6.6	6.6	6.6
PIN 16	9.1	9.1	9.1	9.1	9.1
PIN 17	0.7	-0.4	0.7	0.7	0
PIN 18	3.5	3.5	3.5	3.5	3.5
PIN 19	5.5	5.5	5.5	5.4	5.5
PIN 20	4.8	4.8	4.8	4.8	4.8
PIN 21	5.8	6.5	5.8	5.7	5.7
PIN 22	0	0	0	0	0
PIN 23	0	0	0	0	0
PIN 24	5.4	5.3	5.3	0.3	5.3
PIN 25	0.1	1.0	0.1	1.1	1.1
PIN 26	0.9	0.9	0.9	1.0	1.0

IC 8002

PIN NO

0		
	4-8	



Q3001 Q3002 Q3003 Q3004 Q3006 Q3007 Q3008 Q3009

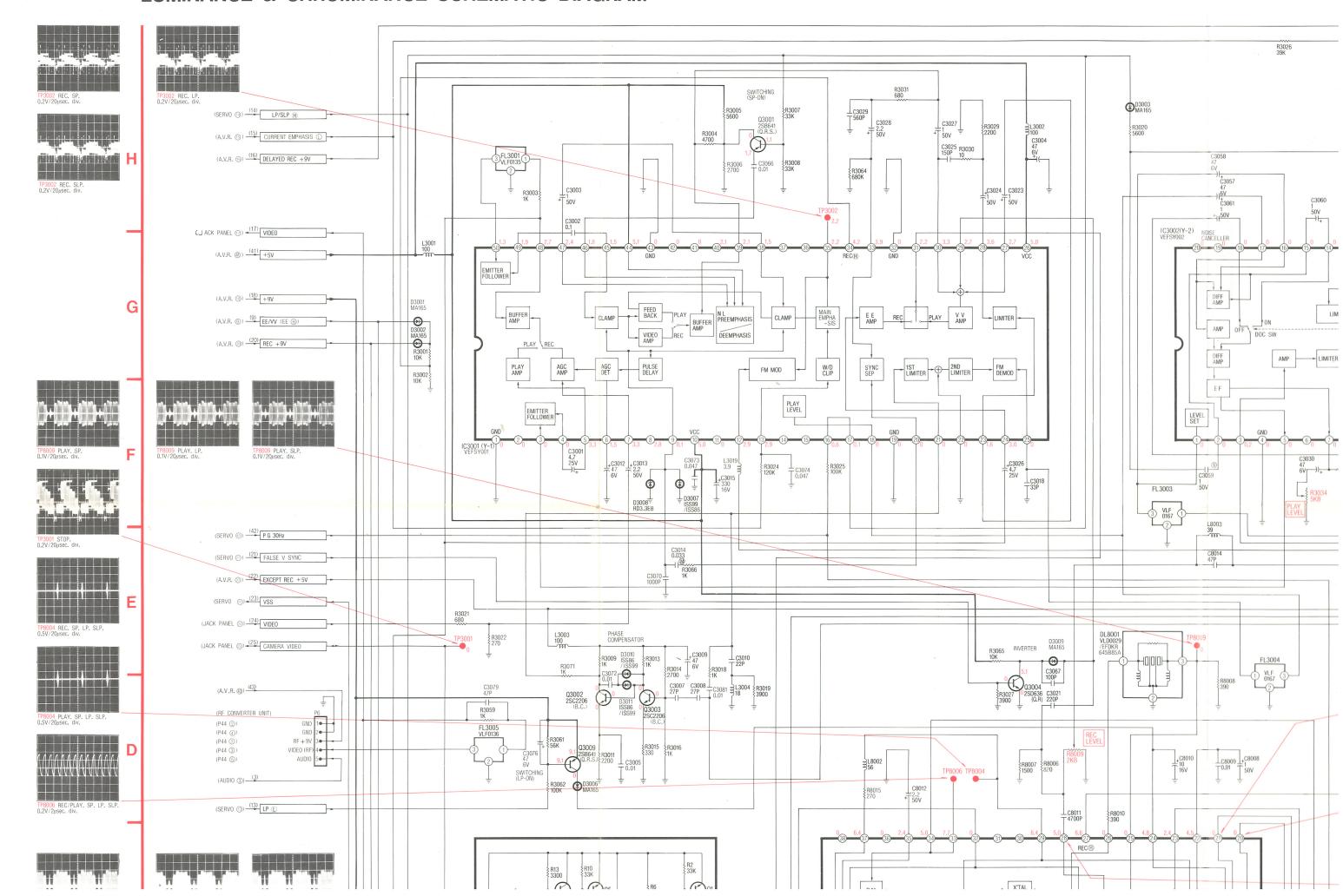
A.V.R. C.B.A.

PIN NO.

PIN 1 2 PIN 3 PIN 10 PIN 11 PIN 12 PIN 13 PIN 16 PIN 17 PIN 18 PIN 20 PIN 21 PIN 22 PIN 25 PIN 26 PIN 27 PIN 28 PIN 29 PIN 30 PIN 31 PIN 31 PIN 32 PIN 34 PIN 36 PIN 37 PIN 37 PIN 38 PIN 39 PIN 40 PIN 41 PIN 42 PIN 42 PIN 42 PIN 42 PIN 44 PIN 45 PIN 44 PIN 45 PIN 46 PIN 47 PIN 48 PIN 49 PIN 47 PIN 48 PIN 49 PIN 47 PIN 48 PIN 48 PIN 49 PIN 47 PIN 48 PIN 49 PIN 50

PIN NO. PIN 1
PIN 2
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PIN 18

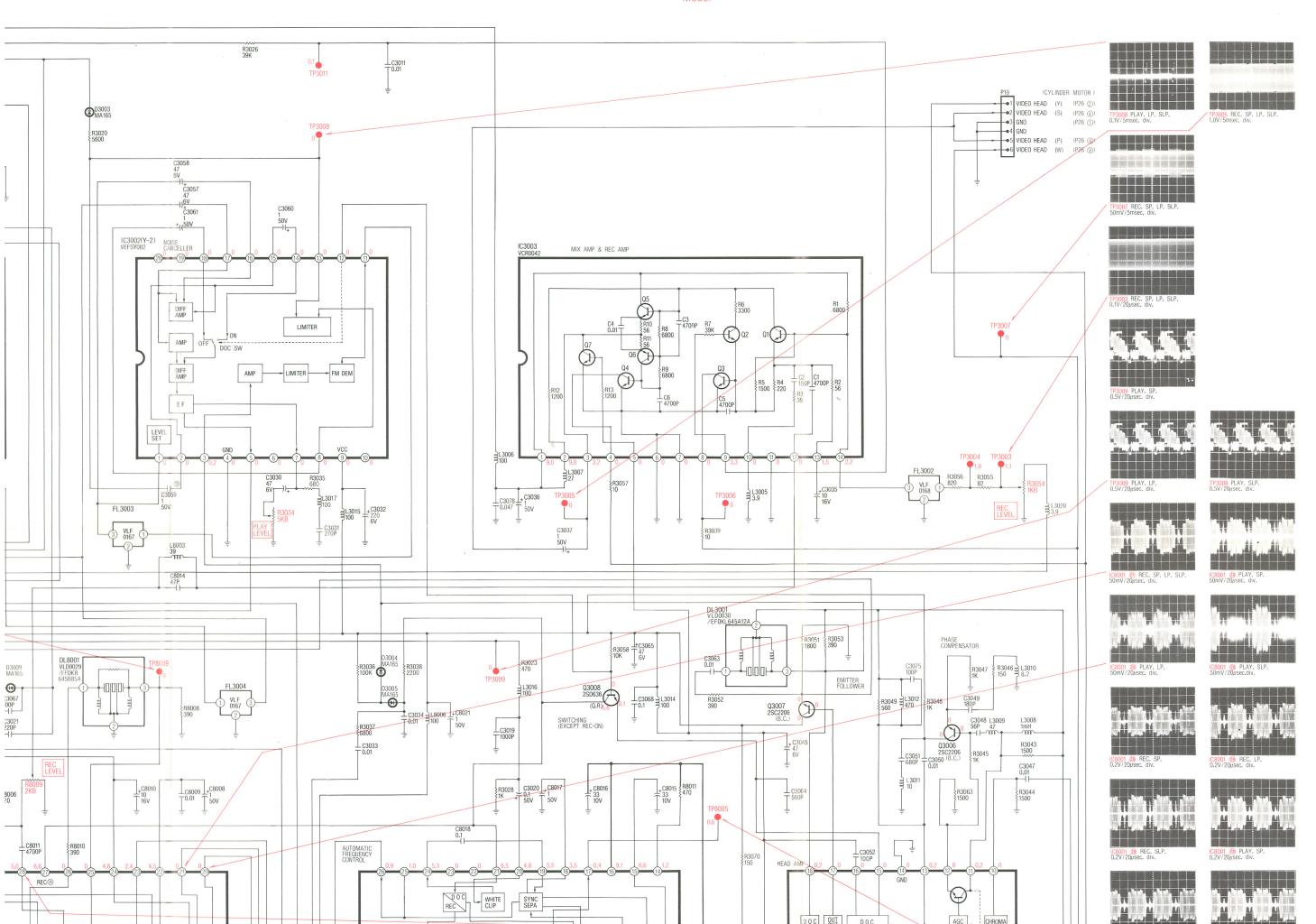
### LUMINANCE & CHROMINANCE SCHEMATIC DIAGRAM

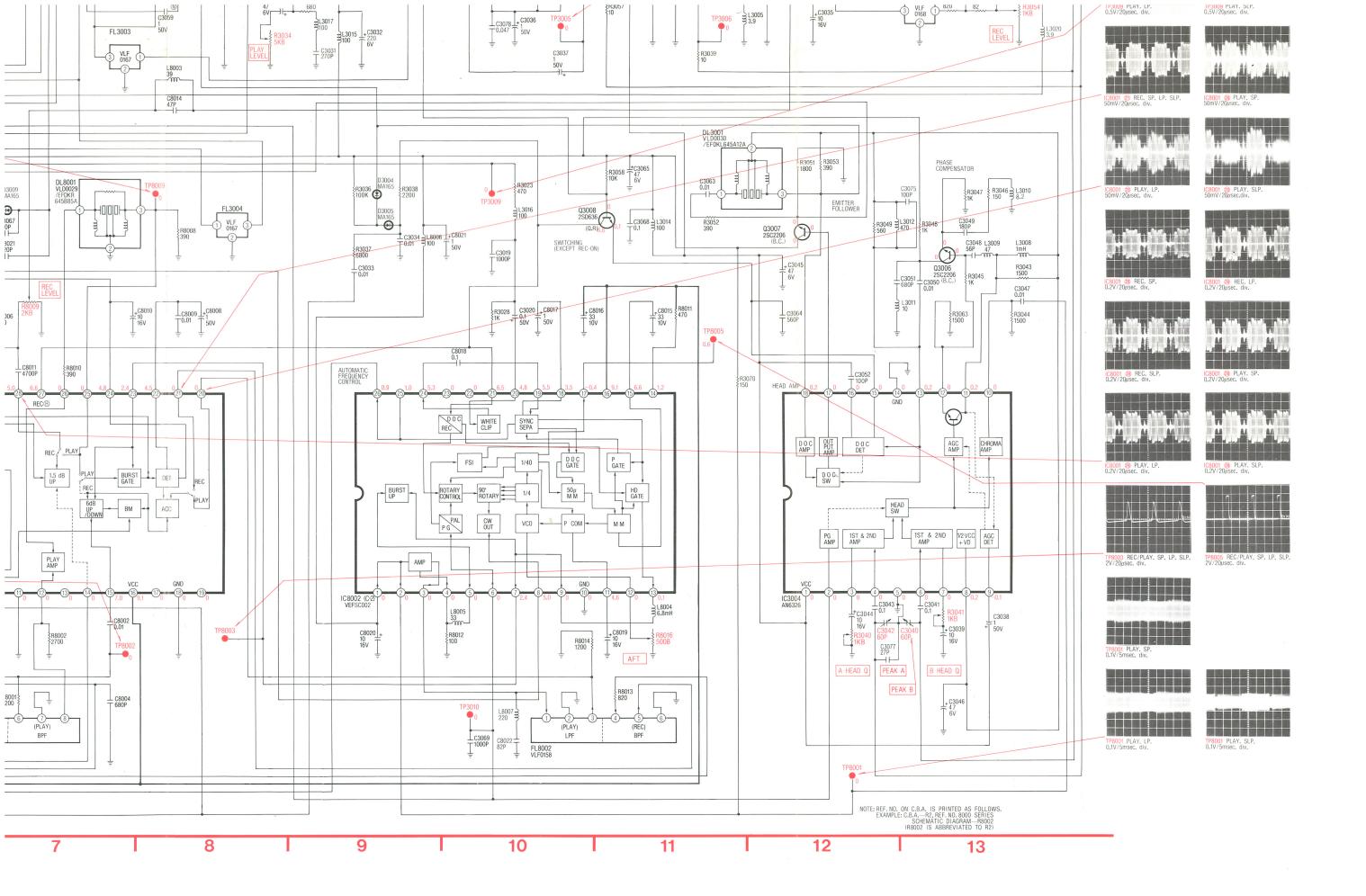


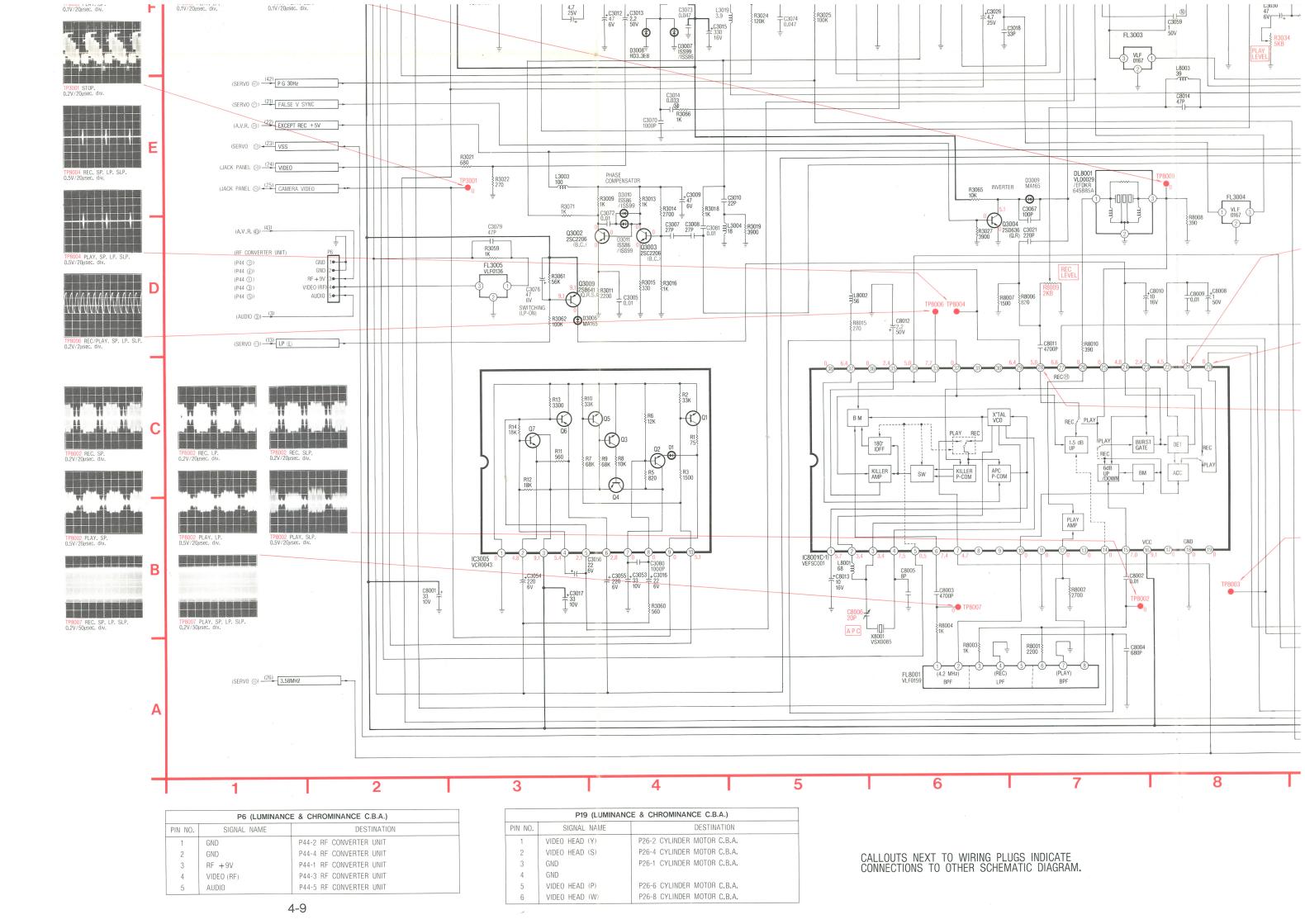
SCHEMATIC DIAGRAM

4-9

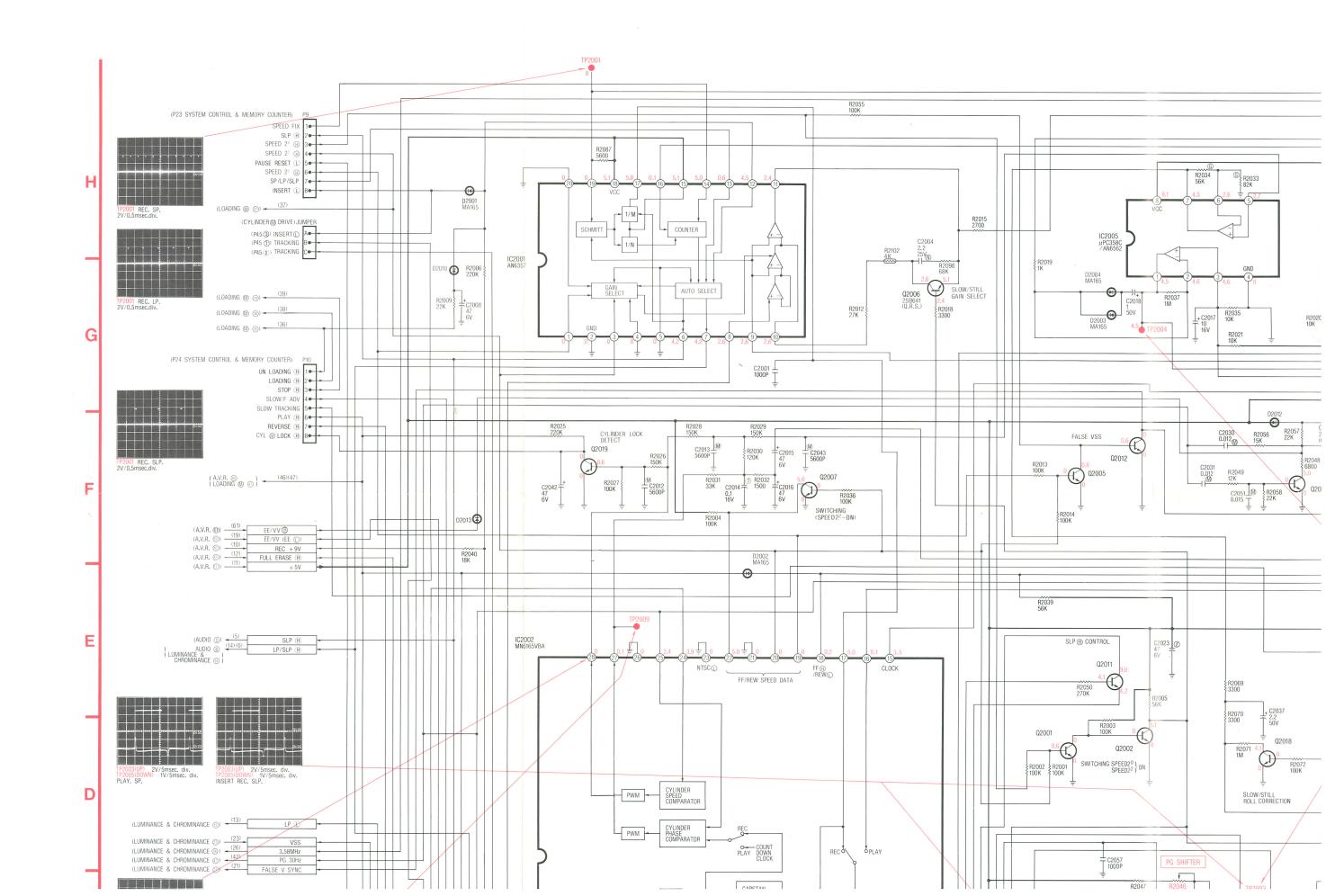
THE VOLTAGE MEASUREMENTS GIVEN IN THIS DRAWING ARE COLOR BAR SIGNAL IN SP-REC

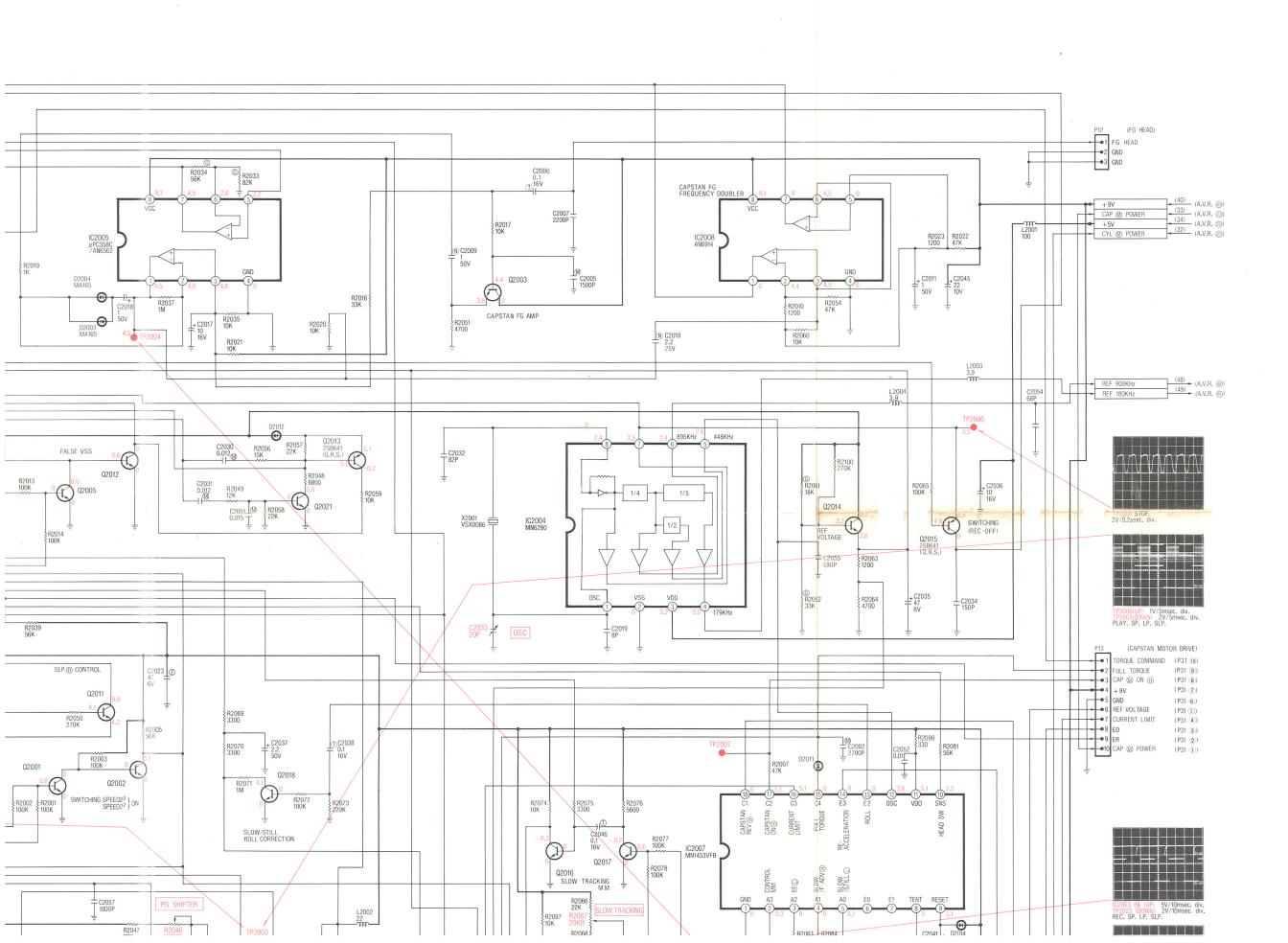


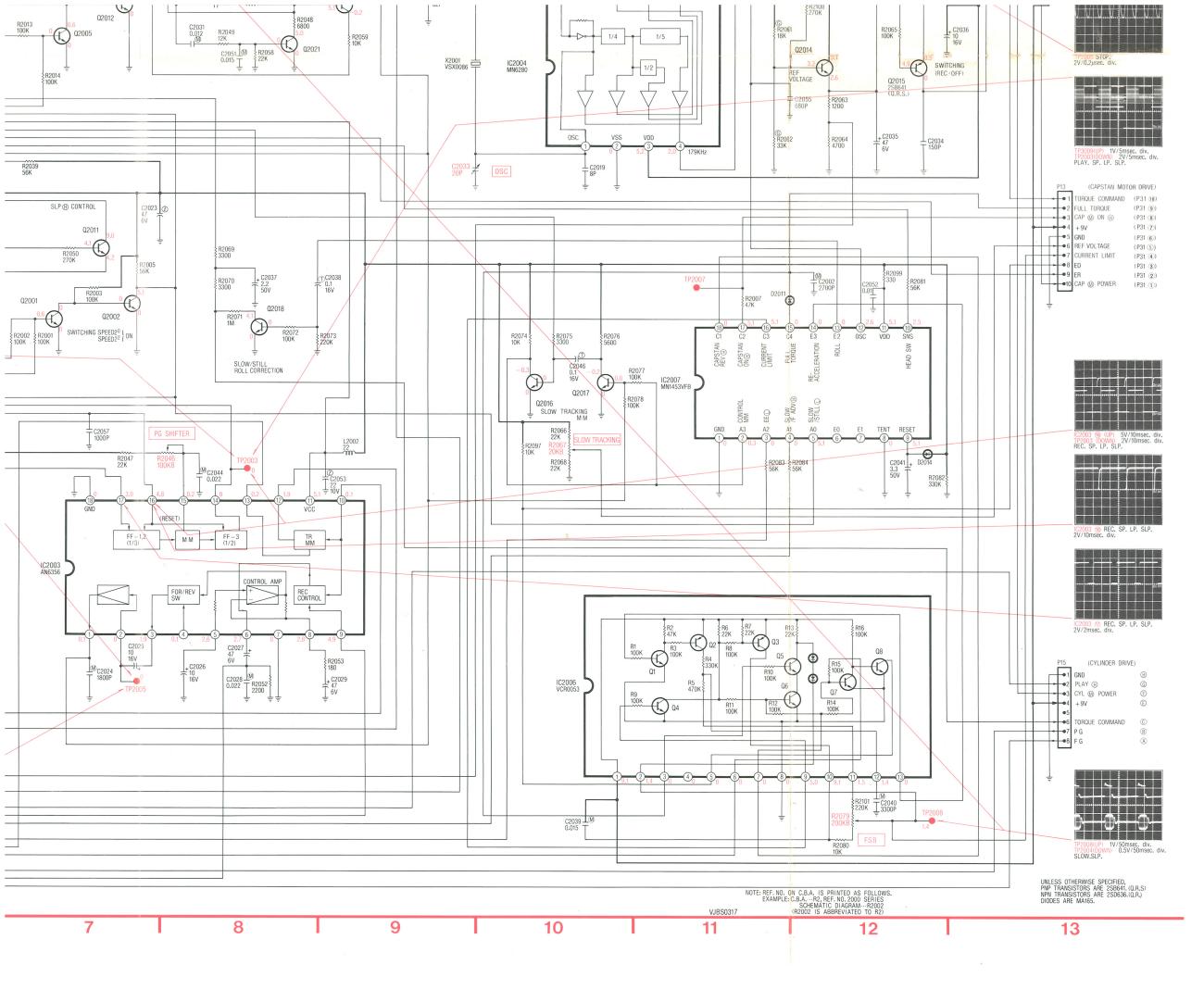


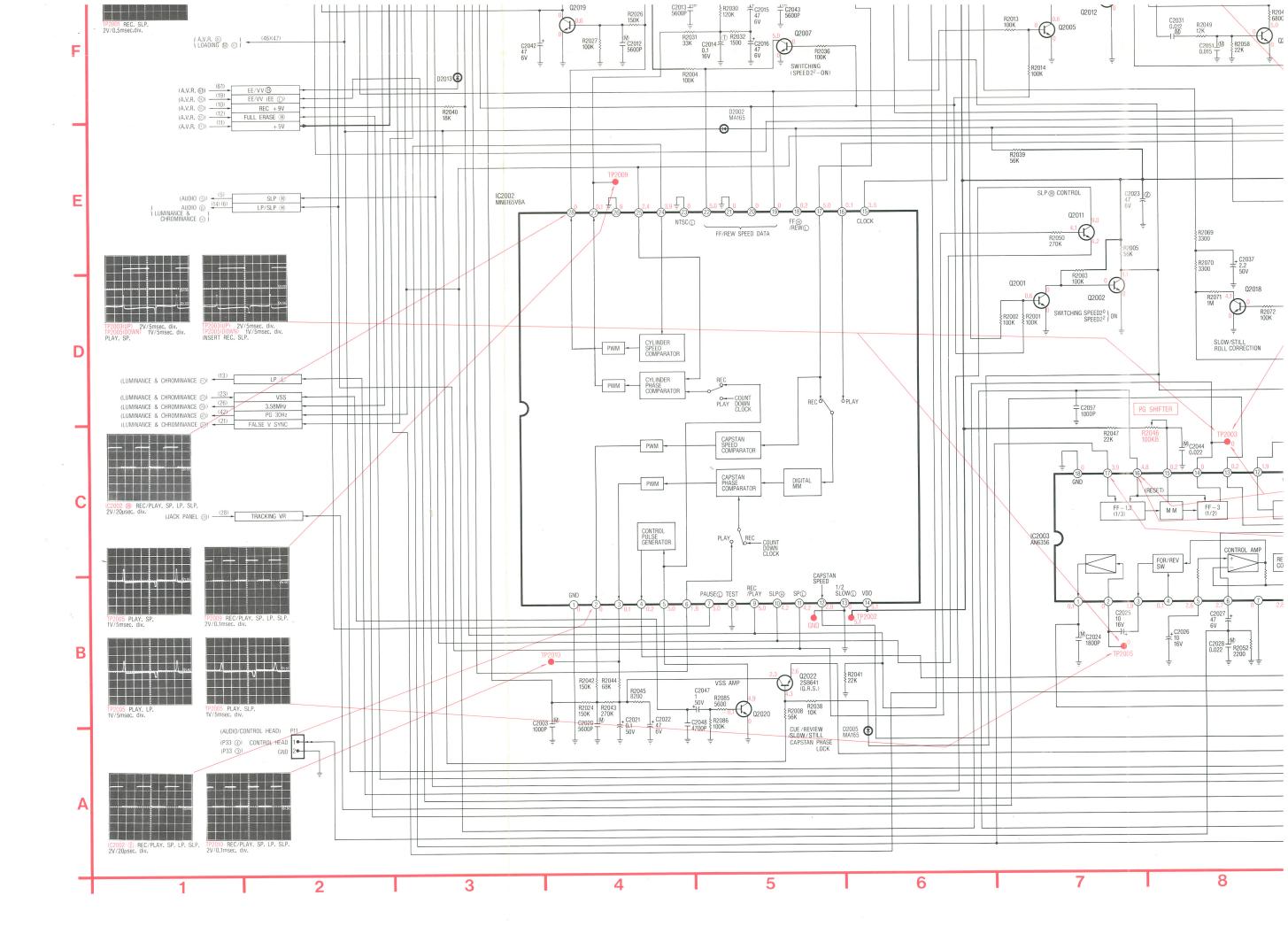


# SERVO SCHEMATIC DIAGRAM









# MAIN C.B.A.

	P9 (	SERVO C.B.A.)
PIN NO.	SIGNAL NAME	DESTINATION
1	SPEED FIX	P23-1 SYSTEM CONTROL & MEMORY COUNTER C.B.A.
2	SLP (H)	P23-2 SYSTEM CONTROL & MEMORY COUNTER C.B.A.
3	SPEED 2° (H)	P23-3 SYSTEM CONTROL & MEMORY COUNTER C.B.A.
4	SPEED 22 H	P23-4 SYSTEM CONTROL & MEMORY COUNTER C.B.A.
5	PAUSE RESET (	P23-5 SYSTEM CONTROL & MEMORY COUNTER C.B.A.
6	SPEED 2 3 H	P23-6 SYSTEM CONTROL & MEMORY COUNTER C.B.A.
7	SP/LP/SLP	P23-7 SYSTEM CONTROL & MEMORY COUNTER C.B.A.
8	INSERT (	P23-8 SYSTEM CONTROL & MEMORY COUNTER C.B.A.

	P10 (S	ERVO C.B.A.)
PIN NO.	SIGNAL NAME	DESTINATION
1	UNLOAD (H)	P24-1 SYSTEM CONTROL & MEMORY COUNTER C.B.A.
2	LOAD (H)	P24-2 SYSTEM CONTROL & MEMORY COUNTER C.B.A.
3	STOP (H)	P24-3 SYSTEM CONTROL & MEMORY COUNTER C.B.A.
4	SLOW/FADV	P24-4 SYSTEM CONTROL & MEMORY COUNTER C.B.A.
5	SLOW/TRACKING	P24-5 SYSTEM CONTROL & MEMORY COUNTER C.B.A.
6	PLAY (H)	P24-6 SYSTEM CONTROL & MEMORY COUNTER C.B.A.
7	REVERSE (H)	P24-7 SYSTEM CONTROL & MEMORY COUNTER C.B.A.
8	CAT W FOCK (A)	P24-8 SYSTEM CONTROL & MEMORY COUNTER C.B.A.

	P11 (S	ERVO C.B.A.)
PIN NO.	SIGNAL NAME	DESTINATION
1	CONTROL HEAD	P33-4 AUDIO/CONTROL HEAD C.B.A.
2	GND	P33-3 AUDIO/CONTROL HEAD C.B.A.

	P12 (S	ERVO C.B.A.)
PIN NO.	SIGNAL NAME	DESTINATION
1	FG HEAD	P32-2 FG HEAD C.B.A.
2	GND	P32-1 FG HEAD C.B.A.
3	GND	

	P13 (S	ERVO C.B.A.)
PIN NO.	SIGNAL NAME	DESTINATION
1	TORQUE COMMAND	P31-10 CAPSTAN MOTOR DRIVE C.B.A.
2	FULL TORQUE	P31-9 CAPSTAN MOTOR DRIVE C.B.A.
3	CAP M ON H	P31-8 CAPSTAN MOTOR DRIVE C.B.A.
4	+9V	P31-7 CAPSTAN MOTOR DRIVE C.B.A.

1	GND
2	+12V
P2	
1	CLOCK 2
2	SAFETY TAB
3	ANT/CH LOCK
4	GND
5	AUDIO
6	SERIAL DATA
7	GND
8	GND
9	VIDEO
10	+ 12V
11	EXT +12V
12	GND

Р3	
1	+ 12V
2	EXT +12V
3	GND
4	BATTERY CHARGE
5	+ 12V
6	+12V

1	SERIAL DATA
2	TC ( SERIAL
3	CAMERA IN
4	STAND BY
5	CAMERA PAUSE (
6	TALLY & CLOCK 1
7	CLOCK 2
8	SAFETY TAB ON ①
9	ANT/CH LOCK (H)
10	GND

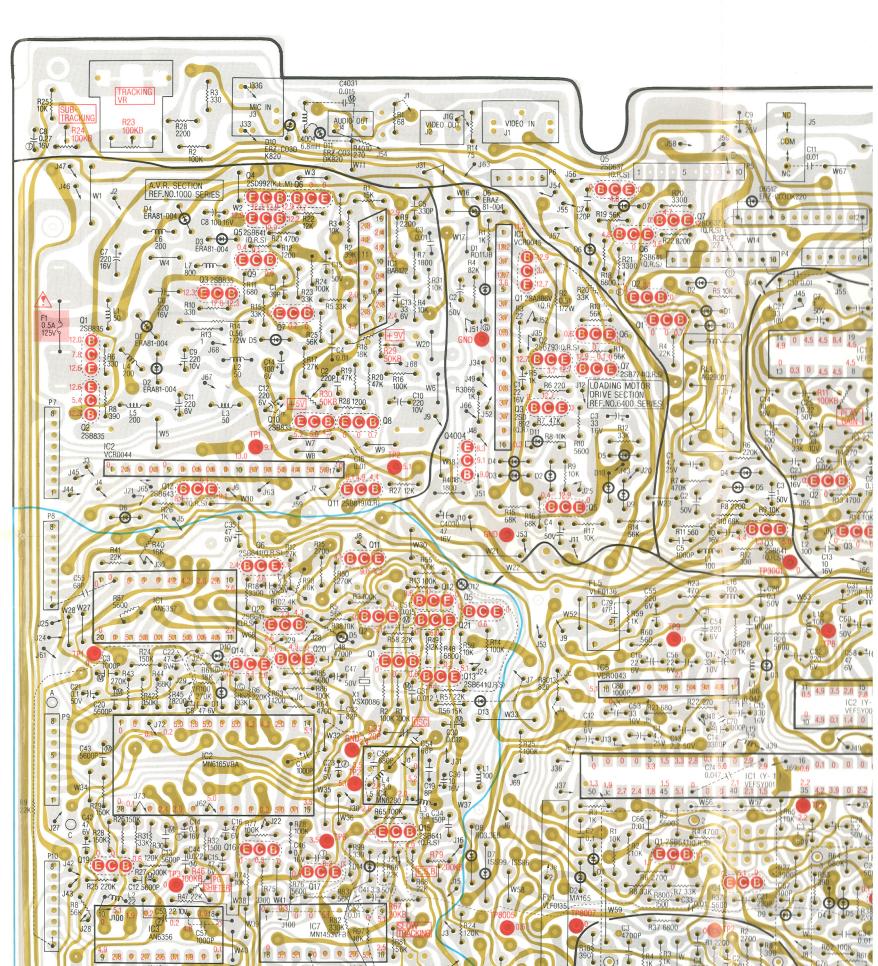
P5	-
1	SERIAL DATA
2	AUDIO
3	GND
4	CAMERA VIDEO
5	GND
6	GND
7	STAND BY
8	CAMERA PAUSE
9	TALLY & CLOCK 1
10	+ 12V

GND
GND
RF +9V
VIDEO(RF)
AUDIO

1	AUDIO EE (H)
2	AUDIO MUTING (H)
3	CURRENT EMPHASIS (
4	POWER OFF (H)
5	+ 5V
ĉ	+ 9V
7	+ 12V
8	GND

REF 900KHz
REF 180KHz
SAFETY TAB (
EE/VV(EE())
FULL ERASE (H)
REC ①
AUDIO REC (H)
DELAY REC (H)
DELAY REC (H)

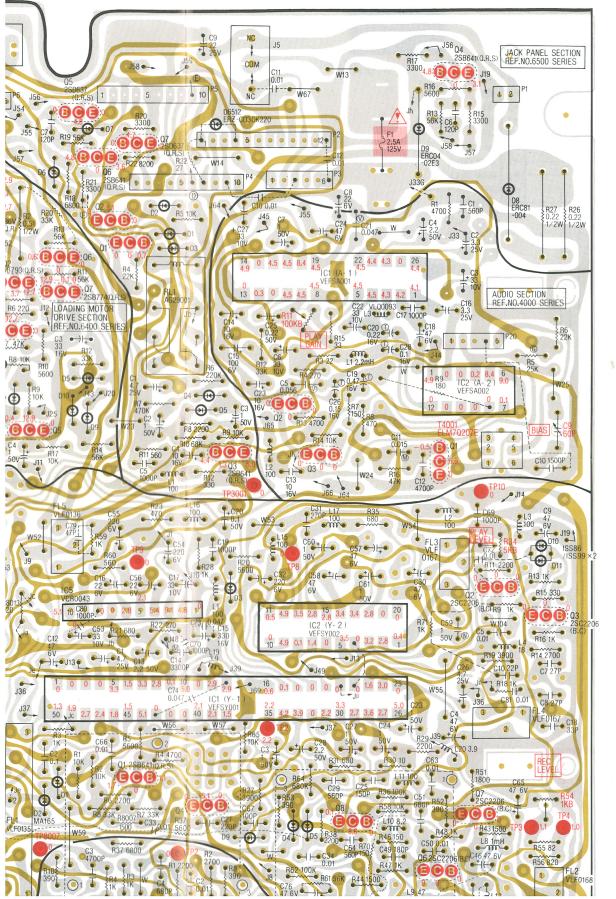
Р9	
1	SPEED FIX
2	SLP (H)
3	SPEED 2° ⊕
4	SPEED 2 <sup>2</sup> ⊕
5	PAUSE RESET ①
6	SPEED 2 <sup>3</sup> (H)
7	SP/LP/SLP
_	

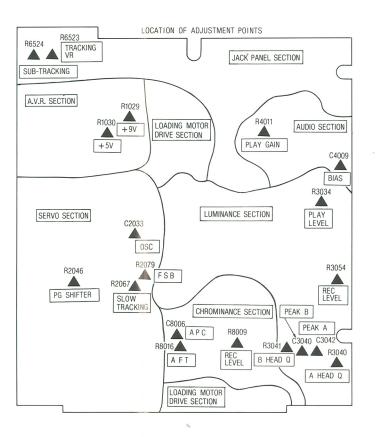


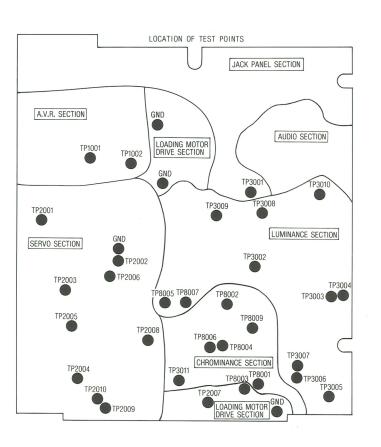
ON A HAVE NT FOR SAFETY. MPONENTS, USE

THE VOLTAGE MEASUREMENTS GIVEN IN THIS DRAWING ARE COLOR BAR SIGNAL IN SP-REC MODE.

EXCEPT A.V.R. SECTION AND JACK PANEL SECTION (STOP MODE).







A.V.R.	C.B.A.
Q1	2-G
Q2	2-F
Q3	2-G
Q4	3-G
Q5	3-G
Q6	3-G
Q7	3-G
Q8	3-F
Q9	2-G
Q10	3-F
Q11	3-F
Q12	2-F

AUDIO C.B.A.  Q1 6-F  Q2 6-F  Q3 6-F  Q4 4-F					
Q1	6-F				
Q2	6-F				
Q3	6-F				
Q4	4-F				

7	
JACK PANEL	C.B.A.
Q1	5-G
Q2	5-G
Q3	5-F
Q4	6-H
Q5	4-H
Q6	5-G
Q7	5-G

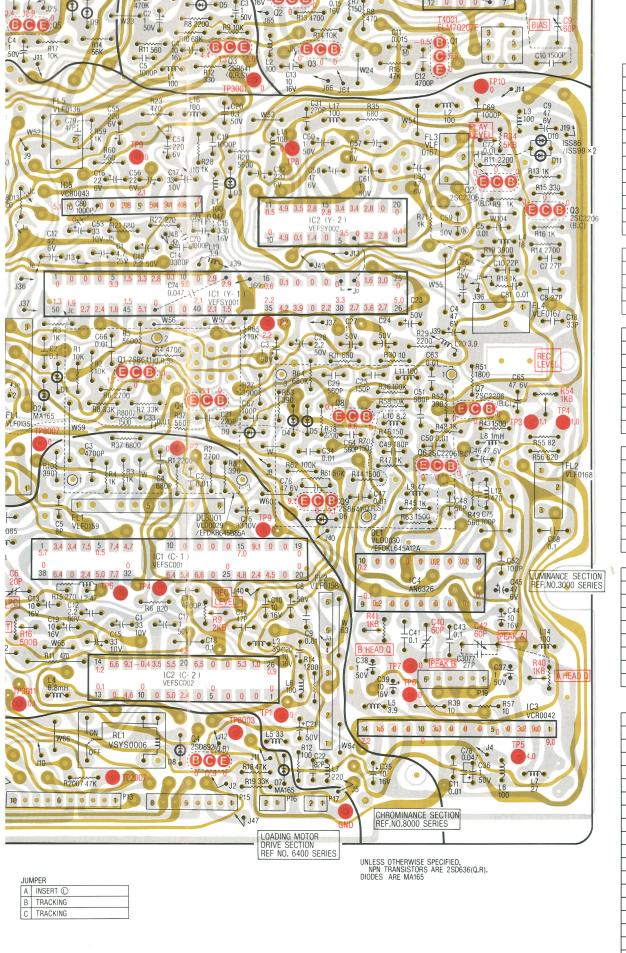
LOADING	MOT	ΓOR	C.B.A.	_
Q1			4-G	
Q2			4-G	

	STOP				REC			PLAY			CUE			REV			SL0W(1/4	)		F.A	
	E	В	C	E	В	С	E	В	C	E	В	C	Е	В	С	E	В	C	- E	В	C
Q2001	0	0	0.6	0	0.6	0	0	0.6	0	0	0.5	0	0	0.6	0	0	0	0.6	0	0	0.6
Q2002	0	0.6	0	0	0	5.1	0	0	5.0	0	0	5.0	0	0	5.0	0	0.6	0	0	0.6	0
Q2003	3.7	4.3	9.1	3.8	4.4	0	3.7	4.4	9.1	3.7	4.4	9.1	3.7	4.3	9.1	3.7	4.4	9.1	3.7	4.4	9.1
Q2005	0	0	0	0	0	0.6	0	0	0.6	0	0.6	0	0	0.6	0	0	0	0	0	0	0
Q2006	0.9	1.5	1.5	5.1	2.4	2.6	5.0	2.4	2.5	5.0	2.3	2.5	5.0	2.3	2.6	1.5	2.2	2.2	1.5	2.2	2.2
Q2007	0	0	5.0	0	0	5.0	0	0	5.0	0	0	5.0	0	0	5.0	0	0	5.0	0	0	5.0
Q2011	0	0.1	8.9	4.2	4.1	9.0	4.1	4.1	8.9	4.1	4.1	8.9	4.1	4.0	8.9	4.1	4.0	8.9	4.1	4.0	8.9
Q2012	0	0	0	0	0.6	0	0	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0
Q2013	5.1	5.1	0	5.1	5.1	-0.2	5.0	5.0	-0.2	5.0	5.0	-0.2	5.0	5.0	-0.2	5.0	5.0	-0.2	5.0	5.0	-0.2
Q2014	0	0.1	3.4	2.6	3.2	5.1	2.6	3.2	5.0	2.5	3.2	5.0	2.6	3.2	5.0	2.6	3.2	5.0	2.6	3.2	5.0
Q2015	3.5	4.1	4.7	3.5	4.9	0	3.4	4.1	4.7	3.5	4.0	4.7	3.5	4.1	4.7	3.4	4.1	4.7	3.4	4.0	4.7
Q2016	0	0.6	0	0	0	-0.3	0	0	-0.3	0	0	3.7	0	0	3.6	0	0.5	-0.3	0	0.6	0
Q2017	0	0	5.0	0	0.6	-0.2	0	0.2	0.2	0	0.5	0.8	0	0.5	1.0	0	0	4.5	0	0	4.8
Q2018	0	0	2.1	0	0	4.1	0	0	4.1	0	0	4.1	0	0	4.1	0	0	3.2	0	0	4.0
Q2019	0	0	0	0	0.6	0	0	0.5	0	0	0.5	0	0	0.6	0	0	0.5	0	0	0.5	0
Q2020	0	0	5.0	0	-0.1	4.9	0	5.1	4.8	0	-0.4	4.7	0	-0.4	4.7	-0.4	0	4.7	0	0.4	4.1
Q2021	0	0	5.1	0	0	5.0	0	0	5.0	0	0	4.9	0	0	4.9	0	0	5.0	0	0	4.9
Q2022	2.6	1.9	2.6	2.6	4.3	2.3	2.6	4.3	2.3	2.6	4.3	2.2	2.6	4.3	2.1	2.6	1.9	2.6	2.6	2.0	2.6

DIM	NO.				10 2001			
FIIV	WO.	STOP	REC	PLAY	CUE	REV	SL0W(1/4)	F.A
PIN	1	0	0	0	5.0	5.0	0	0
PIN	2	0	0	0	0	0	0	0
PIN	3	0	0	0	0	0	0	0
PIN	4	0	0	0	0	0	0	0
PIN	5	0	0	0	0	0	0	0
PIN	6	0	4.2	4.1	4.1	4.0	4.1	4.1
PIN	7	0.1	4.2	4.0	4.2	4.1	4.1	4.1
PIN	8	1.2	2.6	2.6	2.6	2.6	1.3	2.6
PIN	9	2.6	2.6	2.6	2.6	2.6	2.6	2.6
PIN	10	2.6	2.6	2.6	2.6	2.6	2.6	2.6
PIN	11	1.5	2.4	2.4	2.4	2.3	2.2	2.3
PIN	12	0.7	4.5	0.6	0.6	0.6	0	0.6
PIN	13	0.5	0.6	0.6	0.6	0.6	0.6	0.5
PIN	14	5.0	5.0	5.0	5.0	5.0	0	5.0
PIN	15	5.0	5.1	5.0	5.0	5.0	5.0	5.0
PIN	16	0	0.1	0	-0.1	-0.1	0	0
PIN	17	0	5.0	4.9	4.9	0	0	4.9
PIN	18	5.0	5.1	5.0	5.0	5.0	5.0	5.0
PIN	19	3.7	0	0	0	0	2.1	0
PIN	20	0	0	0	0	0	0	0

PIN NO.				IC 2003			
PIN NU.	STOP	REC	PLAY	CUE	REV	SL0W(1/4)	F.A
PIN 1	0	0.1	0	-0.1	-0.1	0	0
PIN 2	0.4	0	0	-0.6	-0.6	0.3	0.1
PIN 3	1.1	1.9	1.1	1.3	1.2	1.1	1.2
PIN 4	0.1	0.1	0.2	*	0.2	0.1	0.3
PIN 5	2.5	2.6	2.6	2.5	2.6	2.5	2.6
PIN 6	2.6	2.7	2.6	2.5	2.5	2.6	2.6
PIN 7	0	0	0	0	0	0	0
PIN 8	2.6	2.8	2.6	2.6	2.6	2.6	2.6
PIN 9	0	4.9	0	0	0	0	0
PIN 10	0	0.1	0	0	0	0	0
PIN 11	2.8	5.1	5.0	5.0	5.0	5.0	0
PIN 12	1.9	1.9	-0.1	-0.1	1.8	-0.1	1.9
PIN 13	0.1	0.2	0.1	-0.2	0.1	0.1	0.1
PIN 14	5.0	0	0	0	0	0	0
PIN 15	4.8	0.2	0.2	0.2	0.2	0.2	0.2
PIN 16	5.0	4.8	4.8	4.8	4.8	4.8	4.8
PIN 17	5.0	3.9	3.8	3.8	3.8	3.8	3.8
PIN 18	0	0	0	0	0	0	0

IN N	ın				IC 2007			
114 14	10.	STOP	REC	PLAY	CUE	REV	SLOW(1/4)	F.A
PIN	1	0	0	0	0	0	0	0
NIC	2	0	-0.3	0.3	3.7	3.6	-0.3	0
NIC	3	0	0	5.0	5.0	4.9	5.0	5.0
PIN	4	0	0	0	0	0	-0.1	0
NIC	5	0	5.1	5.0	0	5.0	0	0
NIC	6	*	*	*	*	*	*	*
PIN	7	*	*	*	*	*	*	*
NIC	8	0	0	0	0	0	0	0
PIN	9	5.0	5.1	5.0	5.0	5.0	5.0	5.0
JIN .	10	0	2.5	0	0	0	0	0
JIN .	11	5.0	5.1	0	5.0	5.0	5.0	5.0
JIN .	12	2.6	2.6	2.6	2.6	2.6	2.6	2.6
NI.	13	0	0	0	0	0	-0.2	0
JIN .	14	0	0	0	0	0	0.1	4.3
olN .	15	0	0	0	0	0	3.7	4.7
NIO.	16	5.0	5.1	5.0	2.8	5.0	1.7	0
NIC.	17	0	5.1	5.0	0	5.0 '	4.9	5.0
JIN .	18	0	0	0	0	0	0.6	0



A.V.R.	C.B.A.
Q1	2-G
Q2	2-F
Q3	2-G
Q4	3-G
Q5	3-G
Q6	3-G
Q7	3-G
Q8	3-F
Q9	2-G
Q10	3-F
Q11	3-F
Q12	2-F

AUDIO	C.B.A.
Q1	6-F
Q2	6-F
Q3	6-F
Q4	4-F

JACK PANEL	C.B.A.
Q1	5-G
Q2	5-G
Q3	5-F
Q4	6-H
Q5	4-H
Q6	5-G
Q7	5-G

LOADING MO	TOR C.B.A.
Q1	4-G
Q2	4-G
Q3	4-F
Q4	5-B
Q5	4-F
Q6	4-G
Q7	4-G

LUMINANCE	C.B.A.
Q1	5-D
Q2	7-E
Q3	7-E
Q4	5-D
Q6	6-C
Q7	7-D
Q8	6-D
Q9	6-C

SERVO (	C.B.A.
Q1	3-E
Q2	3-E
Q3	2-B
Q5	4-E
Q6	2-E
Q7	4-B
Q 11	3-F
Q12	3-E
Q13	3-E
Q14	2-E
Q15	3-D
Q16	2-D
Q17	3-D
Q18	2-C
Q19	2-D
Q20	3-E
Q21	3-E
Q22	3-E

		OTOD			DEO			D1 414			0115		_								
		STOP			REC			PLAY			CUE			REV	,		SL0W(1/4	1)		F.A	
	E	В	С	E	В	C	E	В	C	E	В	C	E	В	C	E	В	C	E	В	C
Q2001	0	0	0.6	0	0.6	0	0	0.6	0	0	0.5	0	0	0.6	0	0	0	0.6	0	0	0.6
Q2002	0	0.6	0	0	0	5.1	0	0	5.0	0	0	5.0	0	0	5.0	0	0.6	0	0	0.6	0
Q2003	3.7	4.3	9.1	3.8	4.4	0	3.7	4.4	9.1	3.7	4.4	9.1	3.7	4.3	9.1	3.7	4.4	9.1	3.7	4.4	9.1
Q2005	0	0	0	0	0	0.6	0	0	0.6	0	0.6	0	0	0.6	0	0	0	0	0	0	0
Q2006	0.9	1.5	1.5	5.1	2.4	2.6	5.0	2.4	2.5	5.0	2.3	2.5	5.0	2.3	2.6	1.5	2.2	2.2	1.5	2.2	2.2
Q2007	0	0	5.0	0	0	5.0	0	0	5.0	0	0	5.0	0	0	5.0	0	0	5.0	0	0	5.0
Q2011	0	0.1	8.9	4.2	4.1	9.0	4.1	4.1	8.9	4.1	4.1	8.9	4.1	4.0	8.9	4.1	4.0	8.9	4.1	4.0	8.9
Q2012	0	0	0	0	0.6	0	0	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0
Q2013	5.1	5.1	0	5.1	5.1	-0.2	5.0	5.0	-0.2	5.0	5.0	-0.2	5.0	5.0	-0.2	5.0	5.0	-0.2	5.0	5.0	-0.2
Q2014	0	0.1	3.4	2.6	3.2	5.1	2.6	3.2	5.0	2.5	3.2	5.0	2.6	3.2	5.0	2.6	3.2	5.0	2.6	3.2	5.0
Q2015	3.5	4.1	4.7	3.5	4.9	0	3.4	4.1	4.7	3.5	4.0	4.7	3.5	4.1	4.7	3.4	4.1	4.7	3.4	4.0	4.7
Q2016	0	0.6	0	0	D	-0.3	0	0	-0.3	0	0	3.7	0	0	3.6	0	0.5	-0.3	0	0.6	0
Q2017	0	0	5.0	0	0.6	-0.2	0	0.2	0.2	0	0.5	0.8	0	0.5	1.0	0	0	4.5	0	0	4.8
Q2018	0	0	2.1	0	0	4.1	0	0	4.1	0	0	4.1	0	0	4.1	0	0	3.2	0	0	4.0
Q2019	0	0	0	0	0.6	0	0	0.5	0	0	0.5	0	0	0.6	0	0	0.5	0	0	0.5	0
02020	0	0	5.0	0	-0.1	4.9	0	5.1	4.8	0	-0.4	4.7	0	-0.4	4.7	-0.4	0	4.7	0	0.4	4.1
Q2021	0	0	5.1	0	0	5.0	0	0	5.0	0	0	4.9	0	0	4.9	0	0	5.0	0	0	4.9
Q2022	2.6	1.9	2.6	2.6	4.3	2.3	2.6	4.3	2.3	2.6	4.3	2.2	2.6	4.3	2.1	2.6	1.9	2,6	2.6	2.0	2.6

PIN N	ın				IC 2001			
T IIV IV	10.	STOP	REC	PLAY	CUE	REV	SL0W(1/4)	F.A
PIN	1	0	0	0	5.0	5.0	0	0
PIN	2	0	0	0	0	0	0	0
PIN	3	0	0	0	0	0	0	0
PIN	4	0	0	0	0	0	0	0
PIN	5	0	0	0	0	0	0	0
PIN	6	0	4.2	4.1	4.1	4.0	4.1	4.1
PIN	7	0.1	4.2	4.0	4.2	4.1	4.1	4.1
PIN	8	1.2	2.6	2.6	2.6	2.6	1.3	2.6
PIN	9	2.6	2.6	2.6	2.6	2.6	2.6	2.6
PIN 1	10	2.6	2.6	2.6	2.6	2.6	2.6	2.6
PIN 1	11	1.5	2.4	2.4	2.4	2.3	2.2	2.3
PIN 1	12	0.7	4.5	0.6	0.6	0.6	0	0.6
PIN 1	13	0.5	0.6	0.6	0.6	0.6	0.6	0.5
PIN 1	14	5.0	5.0	5.0	5.0	5.0	0	5.0
PIN 1	15	5.0	5.1	5.0	5.0	5.0	5.0	5.0
PIN 1	16	0	0.1	0	-0.1	-0.1	0	0
PIN 1	17	0	5.0	4.9	4.9	0	0	4.9
PIN 1	18	5.0	5.1	5.0	5.0	5.0	5.0	5.0
PIN 1	19	3.7	0	0	0	0	2.1	0
PIN 2	20	0	0	0	0	0	0	0

CUE	REV	SLOW(1/4)	F.A		1 114	140.	STOP	REC	P
5.0	5.0	0	0	1	PIN	1	0	0.1	
0	0	0	0	1	PIN	2	0.4	0	
0	0	0	0	1	PIN	3	1.1	1.9	
0	0	0	0	1	PIN	4	0.1	0.1	
0	0	0	0	1	PIN	5	2.5	2.6	
4.1	4.0	4.1	4.1	1	PIN	6	2.6	2.7	
4.2	4.1	4.1	4.1		PIN	7	0	0	
2.6	2.6	1.3	2.6	1	PIN	8	2.6	2.8	
2.6	2.6	2.6	2.6	1	PIN	9	0	4.9	
2.6	2.6	2.6	2.6		PIN	10	0	0.1	
2.4	2.3	2.2	2.3	1	PIN	11	2.8	5.1	
0.6	0.6	0	0.6		PIN	12	1.9	1.9	-
0.6	0.6	0.6	0.5	1	PIN	13	0.1	0.2	
5.0	5.0	0	5.0	1	PIN	14	5.0	0	
5.0	5.0	5.0	5.0	]	PIN	15	4.8	0.2	
-0.1	-0.1	0	0	1	PIN	16	5.0	4.8	
4.9	0	0	4.9	1	PIN	17	5.0	3.9	
5.0	5.0	5.0	5.0	1	PIN	18	0	0	
0	0	2.1	0						
0	0	0	0						
					PIN	NO			
					FIN	NU.	STOP	REC	P
IC 2002					PIN	1	*	*	
CHE	DEM	CLOWING (A)	ГΛ		DIM		0	0	

NIP					IC 2002			
-1IN I	ا .0	STOP	REC	PLAY	CUE	REV	SL0W(1/4)	F.A
PIN	1	0	0	0	0	0	0	0
PIN	2	0.1	0	0	0	0	-0.2	0
PIN	3	0	-0.1	-0.1	0	-0.1	-0.1	-0.1
PIN	4	0	-0.2	0	0	0	0	0
PIN	5	4.8	5.0	4.8	4.7	4.7	4.7	4.8
PIN	6	1.7	1.8	-0.1	1.7	1.7	1.7	-0.1
PIN	7	5.0	5.0	0	0	0	0	0
PIN	8	0	0	0	0	0	0	0
PIN	9	0	5.0	0.6	0.6	0.6	0.6	0.6
PIN	10	0	4.2	4.1	4.1	4.1	4.1	4.1
PIN	11	0.1	4.2	4.1	4.1	4.1	4.1	4.1
PIN	12	2.1	2.0	2.0	2.0	2.0	2.1	2.0
PIN	13	0	0	0	0	0	0	0
PIN	14	5.0	5.1	5.1	5.0	5.0	5.0	5.0
PIN	15	3.4	3.5	3.5	3.4	3.5	3.5	3.5
PIN	16	0	0.1	0	-0.1	-0.2	0	0
PIN	17	0	5.0	4.9	4.9	4.9	0	4.9
PIN	18	0.1	0.2	0.1	0.1	4.7	0.1	0.1
PIN	19	0	0	0	5.0	5.0	0	0
PIN :	20	0	0	0	0	0	0	0
PIN :	21	0	0	0	0	0	0	0
PIN :	22	5.0	5.0	5.0	5.0	5.0	5.0	5.0
PIN :	23	0	0	0	0	0	0	0
PIN :	24	5.0	3.9	3.8	3.8	3.8	3.8	3.8
PIN :	25	5.0	2.4	2.5	0	2.5	2.5	2.5
PIN :	26	0	0	0	0	0	0	0
PIN :	27	0	0.1	0	0	0	0	0
PIN :	28	0.1	0	0	0	0	0	0

PIN NO.				IC 2003			
FIN NO.	STOP	REC	PLAY	CUE	REV	SL0W(1/4)	F.A
PIN 1	0	0.1	0	-0.1	-0.1	0	0
PIN 2	0.4	0	0	-0.6	-0.6	0.3	0.1
PIN 3	1.1	1.9	1.1	1.3	1.2	1.1	1.2
PIN 4	0.1	0.1	0.2	*	0.2	0.1	0.3
PIN 5	2.5	2.6	2.6	2.5	2.6	2.5	2.6
PIN 6	2.6	2.7	2.6	2.5	2.5	2.6	2.6
PIN 7	0	0	0	0	0	0	0
PIN 8	2.6	2.8	2.6	2.6	2.6	2.6	2.6
PIN 9	0	4.9	0	0	0	0	0
PIN 10	0	0.1	0	0	0	0	0
PIN 11	2.8	5.1	5.0	5.0	5.0	5.0	0
PIN 12	1.9	1.9	-0.1	-0.1	1.8	-0.1	1.9
PIN 13	0.1	0.2	0.1	-0.2	0.1	0.1	0.1
PIN 14	5.0	0	0	0	0	0	0
PIN 15	4.8	0.2	0.2	0.2	0.2	0.2	0.2
PIN 16	5.0	4.8	4.8	4.8	4.8	4.8	4.8
PIN 17	5.0	3.9	3.8	3.8	3.8	3.8	3.8
PIN 18	0	0	0	0	0	0	0

IC 2004						
STOP	REC	PLAY	CUE	REV	SL0W(1/4)	F.A
*	*	*	*	*	*	*
0	0	0	0	0	0	0
5.1	5.2	5.1	5.1	5.2	5.2	5.1
2.0	2.0	2.0	2.0	2.0	2.0	2.0
2.6	2.6	2.6	2.6	2.6	2.6	2.6
2.4	2.4	2.4	2.4	2.4	2.4	2.4
3.5	3.5	3.5	3.5	3.5	3.5	3.5
2.4	2.4	2.4	2.4	2.4	2.4	2.4
			IC 2005			
CTOD	DEC	DLAV		DEV	CLOWIS AND	C A
31UF	NEC	PLAT	CUE	HEV	SLUW(1/4)	F.A
	★ 0 5.1 2.0 2.6 2.4 3.5	* * 0 0 5.1 5.2 2.0 2.0 2.6 2.6 2.4 2.4 3.5 3.5 2.4 2.4	* * * * 0 0 0 0 5.1 5.2 5.1 2.0 2.0 2.0 2.6 2.6 2.6 2.6 2.4 2.4 2.4 3.5 3.5 3.5 2.4 2.4 2.4	STOP         REC         PLAY         CUE           ★         ★         ★         ★           0         0         0         0           5.1         5.2         5.1         5.1           2.0         2.0         2.0         2.0           2.6         2.6         2.6         2.6           2.4         2.4         2.4         2.4           3.5         3.5         3.5         3.5           2.4         2.4         2.4         2.4	STOP         REC         PLAY         CUE         REV           ★         ★         ★         ★         ★           0         0         0         0         0           5.1         5.2         5.1         5.1         5.2           2.0         2.0         2.0         2.0         2.0           2.6         2.6         2.6         2.6         2.6           2.4         2.4         2.4         2.4         2.4           3.5         3.5         3.5         3.5         3.5         3.5           2.4         2.4         2.4         2.4         2.4         2.4	STOP         REC         PLAY         CUE         REV         \$L0Wit/4)           ★         ★         ★         ★         ★         ★           0         0         0         0         0         0           5.1         5.2         5.1         5.2         5.2         5.2           2.0         2.0         2.0         2.0         2.0         2.0           2.6         2.6         2.6         2.6         2.6         2.6           2.4         2.4         2.4         2.4         2.4         2.4           3.5         3.5         3.5         3.5         3.5         3.5           2.4         2.4         2.4         2.4         2.4         2.4

PIN NO.				IC 2005			
rin NO.	STOP	REC	PLAY	CUE	REV	SL0W(1/4)	F.A
PIN 1	4.5	4.5	4.5	4.5	4.5	4.5	4.5
PIN 2	4.5	4.6	4.5	4.6	4.6	4.5	4.6
PIN 3	4.5	4.6	4.5	4.6	4.6	4.6	4.6
PIN 4	0	0	0	0	0	0	0
PIN 5	1.3	2.7	2.7	2.7	2.7	2.6	2.7
PIN 6	1.3	2.6	2.7	2.6	2.7	2.7	2.7
PIN 7	2.2	4.5	4.5	4.5	4.5	4.5	4.5
PIN 8	9.1	9.1	9.1	9.1	9.1	9.1	9.1

DIM	NO				IC 2006			
FIIV	PIN NO.	STOP	REC	PLAY	CUE	REV	SL0W(1/4)	F.A
PIN	1	9.1	9.1	9.1	9.1	9.1	9.1	9.1
PIN	2	1.3	1.4	1.4	1.4	1.4	0.3	0
PIN	3	0	0	0	0	0	3.6	4.7
PIN	4	0	0	0	0	0	0	0
PIN	5	0	0	0	0	5.0	-0.4	0
PIN	6	0	0	0	0	5.0	0	0
PIN	7	0	0	0	0	0	0.6	0
PIN	8	0	0	0	0	0	0	0
PIN	9	5.0	5.0	5.0	5.0	5.0	-0.1	0
PIN	10	9.1	9.1	9.1	9.1	9.0	-0.2	0
PIN	11	1.4	1.5	1.5	1.4	1.5	1.2	1.1
PIN	12	1.3	1.4	1.4	1.4	1.4	3.8	*
PIN	13	0	0	0	0	0	2.7	4.3

PIN NO.					IC 2007			
PIN	NU.	STOP	REC	PLAY	CUE	REV	SL0W(1/4)	F.A
PIN	1	0	0	0	0	0	0	0
PIN	2	0	-0.3	0.3	3.7	3.6	-0.3	0
PIN	3	0	0	5.0	5.0	4.9	5.0	5.0
PIN	4	0	0	0	0	0	-0.1	0
PIN	5	0	5.1	5.0	0	5.0	0	0
PIN	6	*	*	*	*	*	*	*
PIN	7	*	*	*	*	*	*	*
PIN	8	0	0	0	0	0	0	0
PIN	9	5.0	5.1	5.0	5.0	5.0	5.0	5.0
PIN	10	0	2.5	0	0	0	0	0
PIN	11	5.0	5.1	0	5.0	5.0	5.0	5.0
PIN	12	2.6	2.6	2.6	2.6	2.6	2.6	2.6
PIN	13	0	0	0	0	0	-0.2	0
PIN	14	0	0	0	0	0	0.1	4.3
PIN	15	0	0	0	0	0	3.7	4.7
PIN	16	5.0	5.1	5.0	2.8	5.0	1.7	0
PIN	17	0	5.1	5.0	0	5.0	4.9	5.0
PIN	18	0	0	0	0	0	0.6	0

PIN NO.				IC 2008			
FIN NO.	STOP	REC	PLAY	CUE	REV	SL0W(1/4)	F.A
PIN 1	3.7	0	0	0	0	*	3.3
PIN 2	4.4	4.4	4.4	4.4	4.4	4.4	4.4
PIN 3	4.5	4.5	4.5	4.5	4.5	4.5	4.5
PIN 4	0	0	0	0	0	0	0
PIN 5	4.6	0	4.6	4.6	4.6	4.6	4.6
PIN 6	4.6	4.5	4.5	4.5	4.5	4.5	4.5
PIN 7	3.7	0	0	0	0	2.1	3.5
PIN 8	9.1	9.1	9.1	9.1	9.1	9.1	9.1

TP NO.	STOP	REC	PLAY	CUE	REV	SLOW(1/4)	F.A
TP2001	3.7	0	0	0	0	*	3.0
TP2002	5.0	5.1	5.0	5.0	5.0	5.0	5.0
TP2003	5.0	0	0	0	0	0	3.5
TP2004	4.5	4.5	4.5	2.6	4.5	3.5	0
TP2005	0.4	0	0	-0.6	-0.6	0.3	*
TP2006	3.5	3.5	3.5	3.5	3.5	4.5	4.5
TP2008	1.4	1.4	1.4	1.4	1.4	0	0

- VOLTAGE MEASUREMENTS:
  1. CUE, REVIEW, SLOW, F.ADV.
  COLOR BAR SIGNAL IN SLP MODE.
- COLOR BAR SIGNAL IN SP MODE.
- ★: UNMEASURABLE OR UNNECESSARY.

		*					
	P10 (SERVO C.B.A.)						
PIN NO.	SIGNAL NAME	DESTINATION					
1	UNLOAD (H)	P24-1 SYSTEM CONTROL & MEMORY COUNTER C.B.A.					
2	LOAD (H)	P24-2 SYSTEM CONTROL & MEMORY COUNTER C.B.A.					
3	STOP (H)	P24-3 SYSTEM CONTROL & MEMORY COUNTER C.B.A.					
4	SLOW/FADV	P24-4 SYSTEM CONTROL & MEMORY COUNTER C.B.A.					
5	SLOW/TRACKING	P24-5 SYSTEM CONTROL & MEMORY COUNTER C.B.A.					
6	PLAY (H)	P24-6 SYSTEM CONTROL & MEMORY COUNTER C.B.A.					
7	REVERSE (H)	P24-7 SYSTEM CONTROL & MEMORY COUNTER C.B.A.					
8	CYL M LOCK ⊕	P24-8 SYSTEM CONTROL & MEMORY COUNTER C.B.A.					

SP/LP/SLP

INSERT (

P23-7 SYSTEM CONTROL & MEMORY COUNTER C.B.A.

P23-8 SYSTEM CONTROL & MEMORY COUNTER C.B.A.

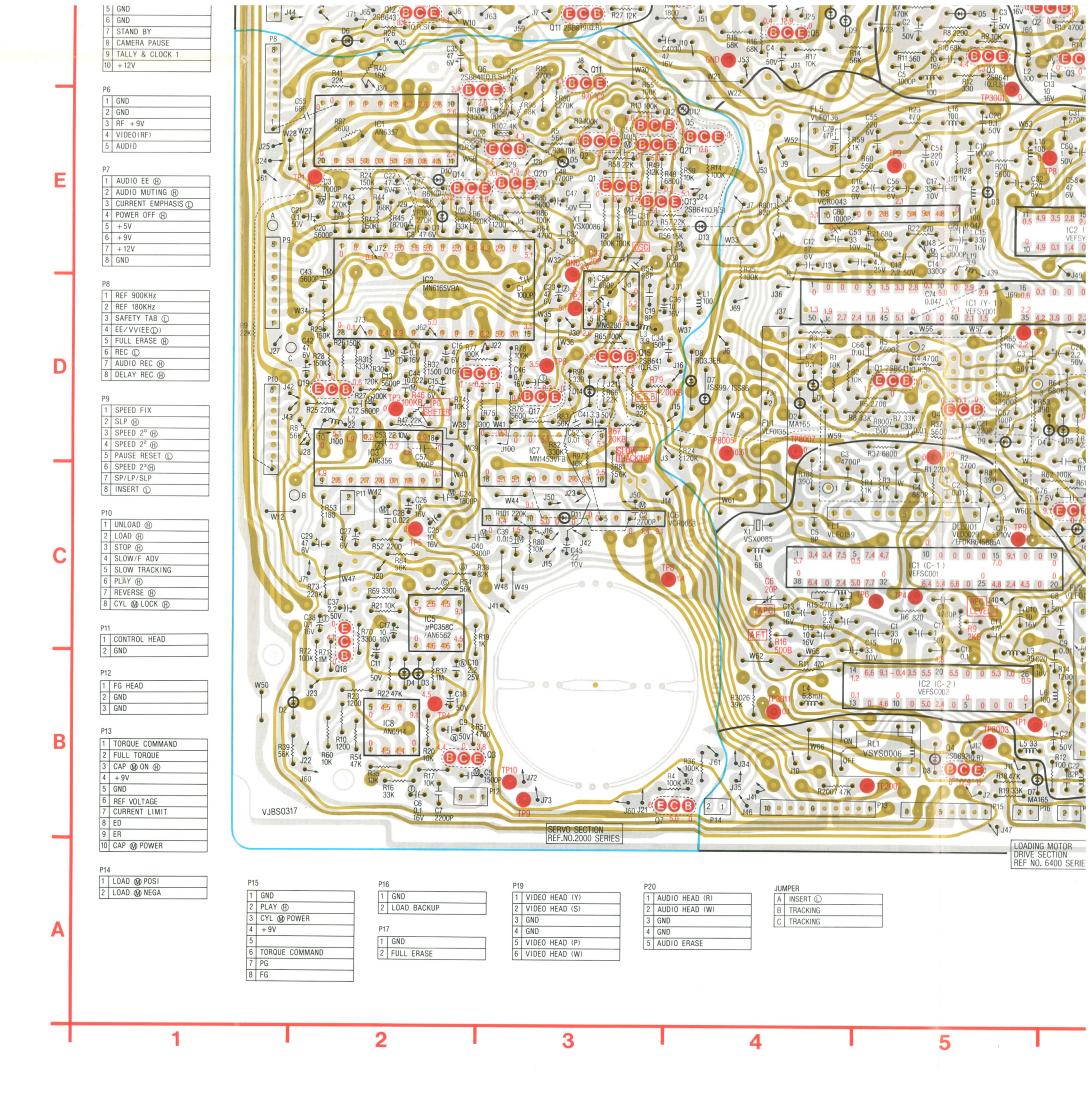
	P11 (SERVO C.B.A.)						
PIN NO.	SIGNAL NAME	DESTINATION					
1	CONTROL HEAD	P33-4 AUDIO/CONTROL HEAD C.B.A.					
2	GND	P33-3 AUDIO/CONTROL HEAD C.B.A.					

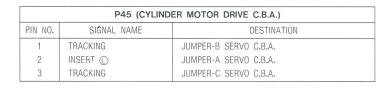
	P12 (SERVO C.B.A.)						
PIN NO.	SIGNAL NAME	DESTINATION	-				
1	FG HEAD	P32-2 FG HEAD C.B.A.					
2	GND	P32-1 FG HEAD C.B.A.					
3	GND						

	P13 (SERVO C.B.A.)						
PIN NO.	SIGNAL NAME	DESTINATION					
1	TORQUE COMMAND	P31-10 CAPSTAN MOTOR DRIVE C.B.A.					
2	FULL TORQUE	P31-9 CAPSTAN MOTOR DRIVE C.B.A.					
3	CAP M ON H	P31-8 CAPSTAN MOTOR DRIVE C.B.A.					
4	+9V	P31-7 CAPSTAN MOTOR DRIVE C.B.A.					
5	GND	P31-6 CAPSTAN MOTOR DRIVE C.B.A.					
6	REF VOLTAGE	P31-5 CAPSTAN MOTOR DRIVE C.B.A.					
7	CURRENT LIMIT	P31-4 CAPSTAN MOTOR DRIVE C.B.A.					
8	ED	P31-3 CAPSTAN MOTOR DRIVE C.B.A.					
9	ER	P31-2 CAPSTAN MOTOR DRIVE C.B.A.					
10	CAP M POWER	P31-1 CAPSTAN MOTOR DRIVE C.B.A.					

	P15 (SERVO C.B.A.)										
PIN NO.	SIGNAL NAME	DESTINATION									
1	GND	JUMPER-H CYLINDER MOTOR DRIVE C.B.A.									
2	PLAY (H)	JUMPER-G CYLINDER MOTOR DRIVE C.B.A.									
3	CYL M POWER	JUMPER-F CYLINDER MOTOR DRIVE C.B.A.									
4	+9V	JUMPER-E CYLINDER MOTOR DRIVE C.B.A.									
5											
6	TORQUE COMMAND	JUMPER-C CYLINDER MOTOR DRIVE C.B.A.									
7	PG	JUMPER-B CYLINDER MOTOR DRIVE C.B.A.									
8	FG	JUMPER-A CYLINDER MOTOR DRIVE C.B.A.									

	JUMPER (SERVO C.B.A.)										
PIN NO.	/ SIGNAL NAME	DESTINATION									
А	INSERT (	P45-2 CYLINDER MOTOR DRIVE C.B.A.									
В	TRACKING	P45-1 CYLINDER MOTOR DRIVE C.B.A.									
С	TRACKING	P45-3 CYLINDER MOTOR DRIVE C.B.A.									





	JUMPER (CYLINDER MOTOR DRIVE C.B.A.)											
PIN NO.	SIGNAL NAME	DESTINATION										
А	PG	P15-7 SERVO C.B.A.										
В	FG	P15-8 SERVO C.B.A.										
С	TORQUE COMMAND	P15-6 SERVO C.B.A.										
Е	+9V	P15-4 SERVO C.B.A.										
F	CYL M POWER	P15-3 SERVO C.B.A.										
G	PLAY (H)	P15-2 SERVO C.B.A.										
Н	GND	P15-1 SERVO C.B.A.										

	JUMPER (CYLIN	IDER MOTOR DRIVE C.B.A.)
PIN NO.	SIGNAL NAME	DESTINATION
1	VH +(+B)	P27-1 CYLINDER MOTOR C.B.A.
2	HES	P27-2 CYLINDER MOTOR C.B.A.
3	HEM	P27-3 CYLINDER MOTOR C.B.A.
4	HEM	P27-4 CYLINDER MOTOR C.B.A.
5	HES	P27-5 CYLINDER MOTOR C.B.A.
6	VH — (GND)	P27-6 CYLINDER MOTOR C.B.A.
7	MAIN COIL 2	P27-7 CYLINDER MOTOR C.B.A.
8	MAIN COIL 3	P27-8 CYLINDER MOTOR C.B.A.
9	MAIN COIL COMMON	P27-9 CYLINDER MOTOR C.B.A.
10	MAIN COIL 1	P27-10 CYLINDER MOTOR C.B.A.

CALLOUTS NEXT TO WIRING PLUGS INDICATE CONNECTIONS TO OTHER SCHEMATIC DIAGRAM.

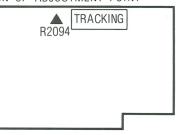
VOLTAGE MEASUREMENTS: COLOR BAR SIGNAL IN SP MODE.

★: UNMEASURABLE OR UNNECESSARY.

		STOP			REC			PLAY			
	Е	В	С	E	В	С	Е	В	C		
Q2023	0	0.6	0	0	0.7	0	0	0.7	0.1		
Q2024	0	0	0	0	0	0	0	0	0		
Q2025	0	0.6	0	0	0.6	0	0	0.6	0		

PIN	NO		IC2501			
PIN	NU.	STOP	REC	PLAY		
PIN	1	12.9	0.3	0.3		
PIN	2	12.9	0.3	0.3		
PIN	3	2.5	2.5	2.5		
PIN	4	2.4	2.4	2.4		
PIN	5	0	0.1	0		
PIN	6	0.5	2.1	2.1		
PIN	7	9.1	9.1	9.1		
PIN	8	0	0.1	0		
PIN	9	8.8	7.9	7.9		
PIN	10	0.7	0.9	0.9		
PIN	11	*	*	*		
PIN	12	0	0	0		
PIN	13	2.3	4.5	4.5		
PIN	14	0.5	0.6	0.6		
PIN	15	0.6	0.6	0.6		
PIN	16	1.7	1.8	1.8		
PIN	17	1.9	1.8	1.8		
PIN	18	0.1	2.4	2.4		
PIN	19	5.0	4.9	4.8		
PIN	20	5.0	3.9	3.8		
PIN	21	12.8	9.8	9.8		
PIN	22	*	*	*		
PIN	23	12.9	0.3	9.6		
PIN	24	0	0	0		

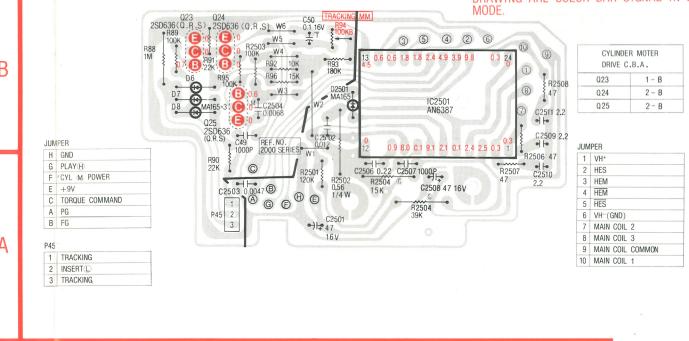




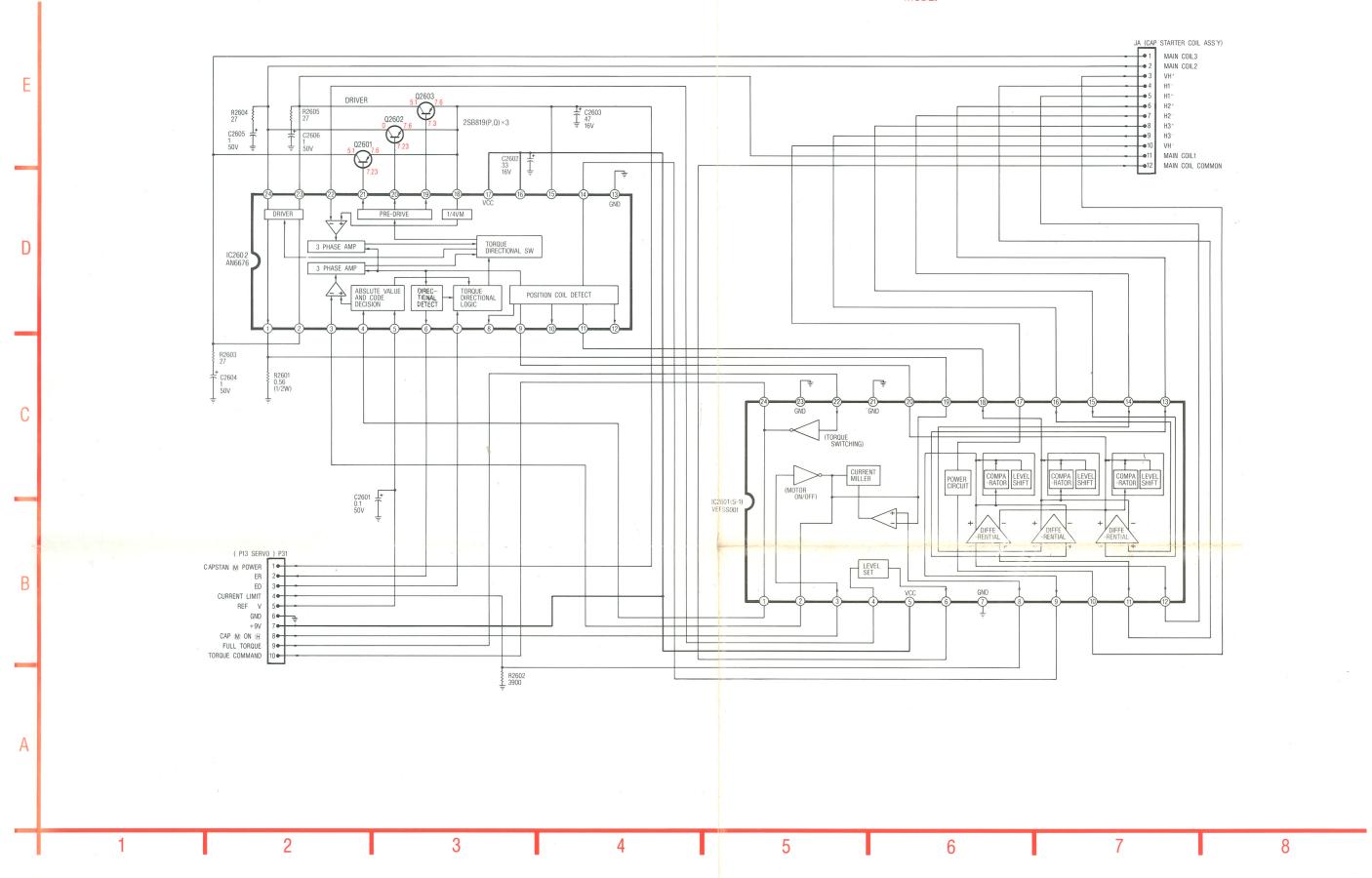


# CYLINDER MOTOR DRIVE C.B.A. (VEPS0227A)

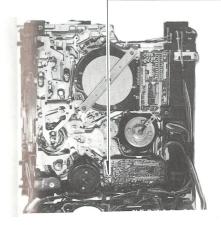
THE VOLTAGE MEASUREMENTS GIVEN IN THIS DRAWING ARE COLOR BAR SIGNAL IN SP-REC MODE.



3



### CAPSTAN MOTOR DRIVE C.B.A.



	P31 (CAPSTA	N MOTOR DRIVE C.B.A.)
PIN NO.	SIGNAL NAME	DESTINATION
1	CAP M POWER	P13-10 SERVO C.B.A.
2	ER	P13-9 SERVO C.B.A.
3	ED	P13-8 SERVO C.B.A.
4	CURRENT LIMIT	P13-7 SERVO C.B.A.
5		<b>&amp;</b>
6	GND	P13-5 SERVO C.B.A.
7	+9V	P13-4 SERVO C.B.A.
8	CAP M ON H	P13-3 SERVO C.B.A.
9	FULL TORQUE	P13-2 SERVO C.B.A.
10	TORQUE COMMAND	P13-1 SERVO C.B.A.

CAPSTAN MOTOR

3 - B

3-B

3-B

DRIVE C.B.A.

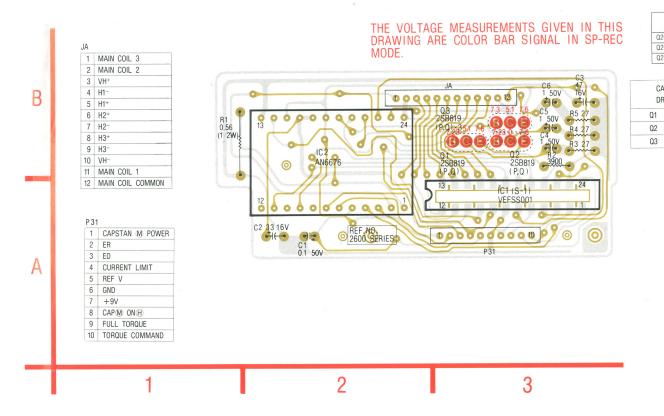
	JA (CAPST	AN MOTOR DRIVE C.B.A.)
PIN NO.	SIGNAL NAME	DESTINATION
1	MAIN COIL 3	JA-1 CAPSTAN STARTER COIL ASS'Y C.B.A.
2	MAIN COIL 2	JA-2 CAPSTAN STARTER COIL ASS'Y C.B.A.
3	VH+ (+B)	JA-3 CAPSTAN STARTER COIL ASS'Y C.B.A.
4	H1 —	JA-4 CAPSTAN STARTER COIL ASS'Y C.B.A.
5	H1 +	JA-5 CAPSTAN STARTER COIL ASS'Y C.B.A.
6	H2+	JA-6 CAPSTAN STARTER COIL ASS'Y C.B.A.
7	H2-	JA-7 CAPSTAN STARTER COIL ASS'Y C.B.A.
. 8	.H3+	JA-8 CAPSTAN STARTER COIL ASS'Y C.B.A.
9	H3 —	JA-9 CAPSTAN STARTER COIL ASS'Y C.B.A.
10	VH- (GND)	JA-10 CAPSTAN STARTER COIL ASS'Y C.B.A.
11	MAIN COIL 1	JA-11 CAPSTAN STARTER COIL ASS'Y C.B.A.
12	MAIN COIL COMMON	JA-12 CAPSTAN STARTER COIL ASS'Y C.B.A.

CALLOUTS NEXT TO WIRING PLUGS INDICATE CONNECTIONS TO OTHER SCHEMATIC DIAGRAM.

VOLTAGE MEASUREMENTS:
1. CUE, REVIEW, SLOW, F.ADV.
COLOR BAR SIGNAL IN SLP MODE.
2. OTHERS
COLOR BAR SIGNAL IN SP MODE.

★: UNMEASURABLE OR UNNECESSARY.

# CAPSTAN MOTOR DRIVE C.B.A. (VEPS0226A)



		STOP			FF			REW			REC			PLAY			CUE			REV		5	SLOW(1/4	1)		F.A	
	E	В	· C	E	В	С	E	В	С	Е	В	С	Е	В	С	Е	В	C	Е	В	С	E	В	С	Е	В	С
Q2601	12.3	11.8	- 7.5	12.1	11.8	7.2	12.1	11.8	7.2	7.6	7.2	5.1	12.1	11.8	7.1	12.0	11.7	7.1	11.9	11.6	7.0	12.0	*	*	12.1	*	*
Q2602	12.3	12.2	7.5	12.1	11.8	7.2	12.1	11.8	7.1	7.6	7.2	0	12.1	11.8	7.2	12.0	11.7	7.1	11.9	11.7	7.1	12.0	*	*	12.0	12.0	*
Q2603	12.3	12.2	7.5	12.1	11.8	7.2	12.1	11.8	7.2	7.6	7.3	5.1	12.1	11.8	7.2	12.0	11.7	7.1	12.0	11.7	7.0	12.0	*	*	12.0	12.0	*

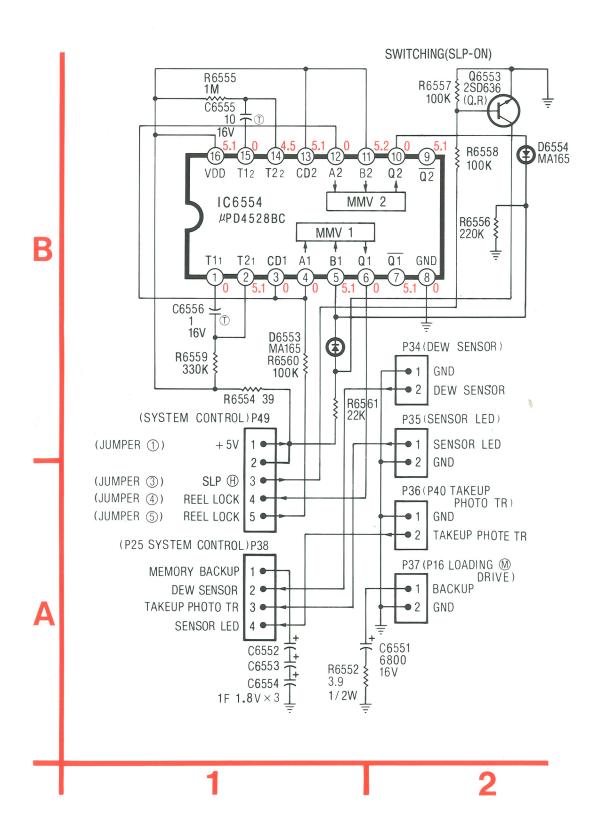
DIN NO					IC2601				
PIN NO.	STOP	FF	REW	REC	PLAY	CUE	REV	SL0W(1/4)	F.A
PIN 1	1.9	2.4	2.4	2.4	2.4	2.3	2.3	0.1	0
PIN 2	1.1	0	0	0	0.1	0.1	0.1	0.4	*
PIN 3	0	4.6	4.6	4.7	4.6	4.6	4.6	4.6	*
PIN 4	4.0	3.9	3.8	2.8	3.9	3.9	3.8	3.8	3.8
PIN 5	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1
PIN 6	7.5	7.2	7.1	5.2	7.1	0	7.0	7.1	7.2
PIN 7	0	0	0	0	0	0	0	0	0
PIN 8	1.4	1.4	1.4	1.4	1.4	1.4	1.4	0.3	*
PIN 9	5.4	5.2	5.2	5.2	5.2	5.3	5.3	5.2	5.0
PIN 10	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
PIN 11	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
PIN 12	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
PIN 13	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.6
PIN 14	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
PIN 15	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
PIN 16	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
PIN 17	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
PIN 18	5.0	5.2	5.2	5.2	5.2	5.3	5.3	*	5.0
PIN 19	0	0.1	0	0	0.1	0.1	0.1	0.1	0
PIN 20	5.4	5.2	5.2	5.2	5.3	0	5.3	*	5.0
PIN 21	0	0	0	0	0	0	0	0	0
PIN, 22	0	0	0	0	0	0	0	*	*
PIN 23	0	0	0	0	0	0	0	0	0
PIN 24	1.9	2.4	2.4	2.4	2.4	2.3	2.3	1.0	*

DIAL M						IC2602				
PIN N	U.	STOP	FF	REW	REC	PLAY	CUE	REV	SLOW(1/4)	F.A
PIN	1	0	0	0	0.1	0	0.1	0.1	0.1	*
PIN	2	7.5	0.3	0.3	5.1	7.1	7.1	7.0	*	*
PIN	3	1.0	0	0.1	0.1	0.1	0.1	0.1	0.4	*
PIN	4	1.9	2.4	2.4	2.4	2.4	2.3	2.3	0.1	0
PIN	5	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
PIN	6	0.5	0.2	0.5	0.2	0.2	0.2	4.7	0.2	0.1
PIN	7.	0	0	5.0	0	0	0	5.0	*	0
PIN	8	4.8	4.6	4.6	4.6	4.6	4.6	4.6	*	*
PIN	9	5.4	5.2	5.2	5.2	5.2	5.3	5.3	*	5.0
PIN 1	0	4.3	4.6	4.6	4.6	4.6	4.6	4.6	*	4.4
PIN 1	1	5.0	5.2	5.2	5.2	5.3	5.3	5.3	*	5.0
PIN 1	2	4.7	4.6	4.6	4.6	4.6	4.6	4.6	*	*
PIN 1	3	0	0	0	0	0	0	0	0	0
PIN 1	4	5.4	5.2	5.2	5.3	5.3	5.3	5.3	*	*
PIN 1	5	12.3	12.1	12.1	7.6	12.1	12.0	11.9	12.0	12.0
PIN 1	6	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1
PIN 1	7	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1
PIN 1	8	12.3	12.1	12.1	7.6	12.0	12.0	11.9	12.0	12.1
PIN 1	9	12.2	11.8	11.8	7.3	11.8	11.7	11.7	*	12.0
PIN 2	0	12.3	11.8	11.8	7.3	11.8	11.7	11.7	*	11.4
PIN 2	1	11.7	11.8	11.8	7.3	11.8	11.7	11.7	*	11.4
PIN 2	2	4.0	3.9	3.9	2.8	3.9	3.8	3.8	3.8	3.8
PIN 2	23	7.5	7.1	7.1	5.1	7.2	7.1	7.0	*	7.6
PIN 2	24	7.5	7.2	7.2	5.2	7.2	7.1	7.1	*	*

4-12

# SUB SYSTEM CONTROL SCHEMATIC DIAGRAM

THE VOLTAGE MEASUREMENTS GIVEN IN THIS DRAWING ARE COLOR BAR SIGNAL IN SP-REC MODE.



	P34 (SUB SYSTEM CONTROL C.B.A.)											
PIN NO.	SIGNAL NAME	DESTINATION										
1	GND	DEW SENSOR										
2	DEW SENSOR	DEW SENSOR										

17	P35 (SUB S	YSTEM CONTROL C.B.A.)
PIN NO.	SIGNAL NAME	DESTINATION
1	SENSOR LED	SENSOR LEDS C.B.A.
2	GND	SENSOR LEDS C.B.A.

	P36 (SUB S	YSTEM CONTROL C.B.A.)
PIN NO.	SIGNAL NAME	DESTINATION
1	GND	P40-1 TAKEUP PHOTO TR C.B.A.
2	TAKEUP PHOTO TR	P40-2 TAKEUP PHOTO TR C.B.A.

	P37 (SUB S	YSTEM CONTROL C.B.A.)
PIN NO.	SIGNAL NAME	DESTINATION
1	LOAD BACKUP	P16-2 LOADING MOTOR DRIVE C.B.A.
2	GND	P16-1 LOADING MOTOR DRIVE C.B.A.

	P38 (SUB SYSTEM CONTROL C.B.A.)				
PIN NO.	SIGNAL NAME	DESTINATION			
1	MEMORY BACKUP	P25-1 SYSTEM CONTROL & MEMORY COUNTER C.B.A.			
2	DEW SENSOR	P25-2 SYSTEM CONTROL & MEMORY COUNTER C.B.A.			
3	TAKEUP PHOTO TR	P25-3 SYSTEM CONTROL & MEMORY COUNTER C.B.A.			
4	SENSOR LED	P25-4 SYSTEM CONTROL & MEMORY COUNTER C.B.A.			

	P49 (SUB SY	YSTEM CONTROL C.B.A.)
PIN NO.	SIGNAL NAME	DESTINATION
1	+5V	JUMPER-1 SYSTEM CONTROL & MEMORY COUNTER C.B.A.
2		2
3	SLP (H)	JUMPER-3 SYSTEM CONTROL & MEMORY COUNTER C.B.A.
4	REEL LOCK	JUMPER-4 SYSTEM CONTROL & MEMORY COUNTER C.B.A.
5	REEL LOCK	JUMPER-5 SYSTEM CONTROL & MEMORY COUNTER C.B.A.

CALLOUTS NEXT TO WIRING PLUGS INDICATE CONNECTIONS TO OTHER SCHEMATIC DIAGRAM.

THE VOLTAGE MEASUREMENTS GIVEN IN THIS DRAWING ARE COLOR BAR SIGNAL IN SP-REC MODE

P35 2 R6554 2SD636(Q.R) P38 1+1F 1.8V IC6554 R6556 µPD4528BC R6552\$ P37 O (1) 3.9 1/2W 2 W1; \$R6560 100K C6552 1.8V D6553 L MA165 1.8V C6551 6800 •-)|-16V GCMK-115X VJBS0649

P34			9
1	GND		
2	DEW	SENSOR	8,

P35		
1	SENSOR	LED
2	GND	5.

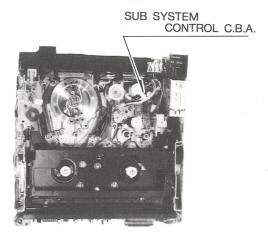
P36			
1	GND		
2	TAKEUP	PH0T0	TR

Р3	37				
1		LOAD	BACKUP		
2	2	GND	· .	1	

P38	H
1	MEMORY BACKUP
2	DEW SENSOR
3	TAKEUP PHOTO TR
4	SENSOR LED
	***************************************

P49	3.40
1	+5V
2	
3	SLP (H)
4	REEL LOCK
5	REEL LOCK

2



SUB-SYSTEM CONTROL C.B.A.

PIN NO.	IC6554								
PIN NO.	STOP	FF	REW	REC	PLAY	CUE	REV	SLOW(1/4)	F.A
PIN 1	0	0	0	0	0	0	0	0	0
PIN 2	5.1	5.1	5.1	5.1	5.1	5.1	5.2	5.1	5.1
PIN 3	0	0	0	0	0	0	0	0 .	0
PIN 4	0	0	0	0	0	0	0	0	0
PIN 5	5.1	5.1	5.1	5.1	5.1	4.5	4.5	5.1	5.1
PIN 6	0	0	0	0	0	0	0	0	0
PIN 7	5.0	5.1	5.1	5.1	5.1	5.1	5.2	5.1	5.1
PIN 8	0	0	0	0	0	0	0	0	0
PIN 9	0	5.1	5.1	5.1	5.1	5.2	5.2	*	0
PIN 10	5.1	0	0	0	0	0	0	*	*
PIN 11	5.1	5.1	5.1	5.2	5.1	5.2	5.2	5.1	5.1
PIN 12	0	0	0	0	0	0	0	0	0
PIN 13	5.1	5.1	5.1	5.1	5.1	5.2	5.2	5.1	5.1
PIN 14	*	4.5	4.5	4.5	4.5	4.6	4.6	*	*
PIN 15	0	0	0	0	0	0	0	0	0
PIN 16	5.1	5.1	5.1	5.1	5.1	5.2	5.2	5.1	5.1

VOLTAGE MEASUREMENTS:
1. CUE, REVIEW, SLOW, F.ADV.
COLOR BAR SIGNAL IN SLP MODE.
2. OTHERS
COLOR BAR SIGNAL IN SP MODE.

★: UNMEASURABLE OR UNNECESSARY.

4-14 SYSTEM CONTROL & MEMORY COUNTER C.B.A.

PIN NO.	STOP	FF	REW	REC	IC6001 PLAY	CUE	REV	SLOW(1/4)	F.A
PIN 1	0	0	0 REW	0	PLAY 0	O	HEV O	SLUW(1/4)	F.A 0
PIN 1	0	0	0	0	0	0	0	0	0
PIN 2	0	0	0	0	0	0	0	0	
PIN 3	4.6	4,5	4.5	4.6	4.5	4.5	4.5	4.5	4.5
PIN 4		5.0	5.0	4.9	4.9	4.8	4.3		
	5.0 - 0.3	0.0	0		- 0.3			5.0	4.8
PIN 6	4.6	4.5	4.5	- 0.3		*	★ 4.5	- 0.2 4.5	- 0.2
				4.6	7.				4.5
PIN 8	0	0	0	0	0	0	0	0	0
PIN 9	5.0	4.9	4.9	4.9	4.9	4.9	4.9	4.9	0
PIN 10	0	5.0	5.0	0	0	4.9	4.9	0	0
PIN 11	0	0	0	0	0	0	0	0	0
PIN 12	- 0.3	5.0	5.0	- 0.3	- 0.3	5.0	5.0	-0.3	0
PIN 13	0.4	- 0.3	- 0.3	- 0.4	-0.4	- 0.4	0	*	. 0.4
PIN 14	0.4	- 0.3	- 0.3	- 0.3	- 0.4	- 0.4	*	*	*
PIN 15	5.1	5.0	5.0	5.1	5.0	5.0	5.0	5.0	5.0
PIN 16	5.1	5.0	5.1	5.1	5.1	0	5.1	5.0	5.1
PIN 17	5.2	5.1	5.1	5.2	5.2	5.1	5.1	5.1	5.1
PIN 18	0	0	0	0	0	0	0	0	0
PIN 19	0	0	0	0	0	0	0	0	0
PIN 20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
PIN 21	.0	0	0	0	0	0	0	0	0
PIN 22	0	0	0	0	0	0	0	0	0
PIN 23	2.2	2.1	2.1	2.2	2.1	2.1	0	2.1	0
PIN 24	3.1	3.1	3.1	3.1	3.1	3.0	0	3.1	3.1
PIN 25	0	4.0	4.0	4.1	4.0	4.0	0	4.0	4.0
PIN 26	5.1	5.0	5.0	E 1	5.1	5.0	0	2.8	Û
PIN 27	3.6	0	0	3.6	3.5	3.5	3.6	3.5	0
PIN 28	3.6	0	3.6	3.6	3.6	3.5	3.6	3.6	0
PIN 29	3.6	0	3.6	3.6	3.6	3.6	0	3.6	0
PIN 30	3.6	0	0	3.6	3.6	3.6	0	0	0
PIN 31	3.6	0	3.6	3.6	3.6	3.5	0	3.6	0
PIN 32	0	3.5	3.6	3.6	3.6	3.6	3.6	3.6	0
PIN 33	0	3.6	3.6	3.6	3.6	3.6	3.6	0	3.6
PIN 34	3.6	3.6	3.6	3.6	3.6	0	0	0	3.6
PIN 35	0	3.6	3.6	3.6	3.6	3.6	3.6	0	3.6
PIN 36	3.6	3.6	3.6	3.6	3.6	3.6	3.6	0	3.6
PIN 37	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.5	0
PIN 38	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
PIN 39	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
PIN 40	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	0
PIN 41	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	0
PIN 42	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	0
PIN 43	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	0
PIN 44	3.6	3.6	3.6	0	3.6	3.6	3.6	3.6	3.6
PIN 45	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	
PIN 46	3.6	3.6	3.6	0	3.6	3.6	3.6	3.6	0
PIN 47	3.6	3.6	3.6	0	3.6	3.6	0	3.6	3.6
PIN 48	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
PIN 49	3.6	3.6	3.6	3.6	3.6	3.6	0	3.6	3.6
PIN 50	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
PIN 51	3.6	3.6	3.6	3.6	3.6	3.6	0	3.6	3.6
PIN 52	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
PIN 53	3.6	0	3.6	3.6	3.6	3.6	3.6	0	0
PIN 54	3.6	3.6	3.6	3.6	3.6	3.6	0	0	0
PIN 55	0	0	0	0	0	0	0	0	0
PIN 56	0	0	0	0	0	0	0	0	0
PIN 57	2.0	2.0	2.0	2.0	2.1	2.1	2.1	0	2.1
PIN 58	5.1	5.0	5.0	5.0	0	5.0	5.0	0	0
PIN 59	3.0	3.0	3.0	3.0	0	3.0	3.0	0	3.0
PIN 60	0	0	0	0	0	0	0	0	0
PIN 61	5.1	0	0	4.8	5.0	*	*	0	0
PIN 62	5.1	0	0	*	0	*	*	0	5.0
PIN 63	5.1	0	0	*	5.0	*	*	0	5.1
00	5.1	5.0	5.0	5.0	5.0	5.0	5.0	0	V.1

TP NO.	STOP	FF	REW	REC	PLAY	CUE	REV	SLOW(1-4)	F.A
TP6001		5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
TP6002	4.6	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5

VOLTAGE MEASUREMENTS:
1. CUE, REVIEW, SLOW, F.ADV.
COLOR BAR SIGNAL IN SLP MODE.
2. OTHERS
COLOR BAR SIGNAL IN SP MODE.

★: UNMEASURABLE OR UNNECESSARY.

					106002				
PIN NO.	STOP	FF	REW	REC	PLAY	CUE	REV	SL0W(1/4)	F.A
PIN 1	0	0	0	0	0	0	0	0	0
PIN 2	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.0	5.1
PIN 3	0	0	0	0	0	0	0	0	0
PIN 4	0	0	0	0	0	0	0	0	0
PIN 5	5.0	5.0	5.0	5.1	0	5.0	5.0	5.0	5.0
PIN 6	5.1	5.0	5.0	5,1	5.0	5.0	5.0	5.0	5.0
PIN 7	4.4	4.3	4.3	4.4	4.4	4.3	4.3	4.3	4.3
PIN 8	4.3	4.3	4.3	4.3	4.2	4.3	4.3	4.3	4.3
PIN 9	0	0	0	0	0	0	0	0	0
PIN 10	0	0	0	0	0	0	0	0	0
PIN 11	0	0	0	0	0	0	0	0	0
PIN 12	- 6	0	0	0	0	0	0	0	0
PIN 13	- 0.3	- 0.2	- 0.2	0.3	0.3	0.4	0.3	0.3	0.3
PIN 14	1.3	1.0	1.0	4.3	4.3	4.2	4.2	4.3	4.3
PIN 15	- 0.2	5.0	5.0	0.9	4.2	4.2	5.0	5.0	5.0
PIN 16	0	0	0	0	0	0	0	0	0
PIN 17	5.0	5.0	5.0	0	5.0	4.8	4.8	5.0	4.9
PIN 18	0	0	0	0	0	0	0	0	0
PIN 19	1.3	0	1.3	0	1.4	1.3	1.3	1.2	0
PIN 20	-0.3	- 0.2	- 0.3	- 0.3	- 0.3	- 0.3	- 0.2	0	- 0.3
PIN 21	- 0.2	0	- 0.1	- 0.1	- 0.1	- 0.1	0	0	0
PIN 22	0	0	0	0	0	0	0	0	0
PIN 23	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
PIN 24	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.0	5.1
PIN 25	4.6	4.5	4.5	4.6	4.6	4.5	0	4.6	4.5
PIN 26	! n	n	n	۸	0	0	0	0	0
PIN 27	0	0	0	0	0	0	0	0	0
PIN 28	0	0	0	0	0	0	0	0	0
PIN 29	5.1	5.1	0	5.1	5.1	5.1	0	5.0	5.1
PIN 30	0	5.1	5.1	5.1	5.1	5.1	5.1	5.0	5.1
PIN 31	5.1	0	5.1	5.1	5.1	0	5.1	5.0	5.1
PIN 32	5.1	5.0	5.0	0	0	0	0	0	0
PIN 33	5.0	0	4.9	0	5.0	4.9	4.9	0	4.9
PIN 34	5.1	5.0	5.0	5.1	5.0	5.0	5.0	5.0	5.0
PIN 35	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.0	0
PIN 36	5.1	5.1	5.1	5.1	5.1	5.1	5.1	0	0
PIN 37	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	0.2
PIN 38	0	0	0	0	0	0	0	0	0
PIN 39	0	0	0	0	0	0	0	0	0
PIN 40	0	0	0	0	0	0	0	0	0
PIN 41	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.0	5.1
PIN 42	0	0	0	0	0	0	0	0	0

PIN NO.					IC6003				
	ST0P	FF	REW	REC	PLAY	CUE	REV	SL0W(1-4)	F.A
PIN 1	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	0
PIN 2	5.1	5.0	5.0	5.0	0	0	0	5.1	0
PIN 3	5.1	5.0	5.0	5.0	0	0	0	5.0	0
PIN 4	0	0	0	0	0	4.8	0	0	4.8
PIN 5	0	0	5.0	0	0	4.9	0	0	0
PIN 6	0	0	0	0	0	5.0	5.0	0	0
PIN 7	0	4.6	4.6	0	0	0	υ	0	0
PIN 8	0	0	0	0	0	0	0	0	0
PIN 9	0	0	0	0	0	0	0	0	0
PIN 10	0	0	0	0	0	4.1	0	0	4.1
PIN 11	5.1	5.2	5.0	0	0	0	0	5.2	0
PIN 12	0	0	0	0	0	0	0	0	0
PIN 13	0	0	0	0	0	0	0	0	0
PIN 14	0	0	0	0	0	0	0	0	0
PIN 15	0	0	0	0	0	0	0	0	0
PIN 16	0	0	0	0	0	0	0	0	0
PIN 17	0	0	0	5.2	5.2	5.2	0	0	5.1
PIN 18	0	0	0	0	0	0	5.0	0	0
PIN 19	0	0	0	5.0	5.0	4.9	4.9	0	0
PIN 20	0	0	0	0	0	0	0	0	0
PIN 21	0.1	0	0	0	0	0	0	0	0
PIN 22	0.1	0	0	0	0	0	0	0	0
PIN 23	0	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
PIN 24	5.1	5.0	5.0	5.0	5.1	5.0	5.0	5.1	5.1
PIN 25	5.1	0	4.5	4.6	4.6	4.6	0	4.5	4.5
PIN 26	4.6	0	0	5.0	5.1	5.0	0	5.1	5.0
PIN 27	5.1	0	0	0	5.1	5.0	0	5.1	0
PIN 28	5.1	0	5.0	0	5.1	5.0	0	- 0.3	5.0
PIN 29	- 0.3	- 0.3	- 0.3	5.0	5.1	5.0	5.0	- 0.3	5.0
PIN 30	- 0.3	- 0.3	- 0.3	0	0	5.0	0	- 0.3	5.0
PIN 31	0	0	0	0	5.0	5.0	5.0	0	5.0
PIN 32	0	0	0	0	5.1	5.0	5.0	0	5.0
PIN 33	0.6	0.6	0.6	0	0	0.5	0	0	0
PIN 34	0.6	0.6	0.6	0	0	0.5	0.5	0	0
PIN 35	0.6	0.5	0.5	0	0	0.5	0.5	0	0
PIN 36	0	5.0	0	5.0	5.1	5.0	5.0	5.1	0
PIN 37	2.4	2.4	0	0	2.4	2.4	2.4	2.4	0
PIN 38	0	0	0	0	0	0	0	0	0
PIN 39	0	4.9	4.9	0	0	0	0	4.9	0
PIN 40	0	0	0	4.9	0	0	0	0	0
PIN 41	0	0	0	5.0	0	0	0	0	0
PIN 42	0	0	0	4.9	0	0	0	0	0

PIN NO.					106004				
PIN NU.	STOP	FF	REW	REC	PLAY	CUE	REV	SL0W(1:4)	F.A
PIN 1	5.1	5.0	5.0	5.1	5.0	5.0	5.0	5.0	5.0
PIN 2	0	0	0	0	0	0	0	0	0
PIN 3	0.2	5.0	5.0	0.9	4.2	5.0	5.0	5.0	5.0
PIN 4	5.1	5.1	5.2	5.2	5.2	5.1	5.2	5.1	5.1
PIN 5	4.3	1.0	1.0	4.3	4.3	4.2	4.2	4.3	4.3
PIN 6	5.2	5.1	5.2	5.2	5.2	5.2	5.2	5.1	5.1
PIN /	- 0.3	- 0.2	- 0.2	3,4	3.4	3.4	3.4	3.5	3.4
PIN 8	0	0	0	0	0	0	0	0	0
PIN 9	5.0	5.0	5.0	5.0	5.0	4.9	4.8	5.0	4.8
PIN 10	0	0	0	0	0	0	0	0	0
PIN 11	5.0	5.0	5.0	4.9	5.0	4.9	4.8	5.0	4.9
PIN 12	4.7	4.8	4.8	4.7	4.7	4.7	4.7	4.9	4.8
PIN 13	2.0	5.0	5.0	0.9	4.2	5.0	5.0	5.0	5.0
PIN 14	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
PIN 15	4.4	4.3	4.3	4.4	4.3	4.3	4.3	4.3	4.0
PIN 16	5.2	5.1	5.2	5.2	5.2	5.2	5.2	5.1	5.2

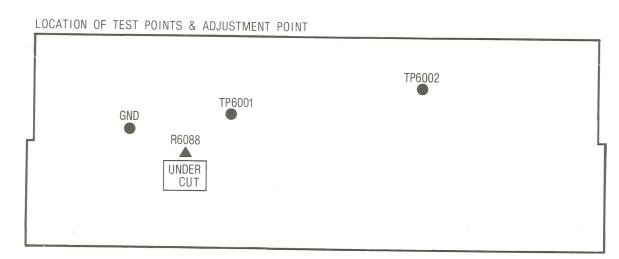
PIN	MO					IC6005				
r i iv	NU.	ST0P	FF	REW	REC	PLAY	CUE	REV	SLOW(1:4)	F.A
PIN	1	4.3	4.3	4.3	4.3	4.2	4.3	4.3	4.3	4.3
PIN	2	0.6	0.6	0.6	0	0.6	0.6	0.6	0.6	0
PIN	3	4.7	- 0.2	- 0.2	0.3	0.3	0.3	0.3	0.3	0.3
PIN	4	4.8	4.8	4.8	4.8	4.7	4.7	4.6	4.9	4.8
PIN	5	5.0	5.0	5.0	4.9	4.9	4.8	4.8	5.0	4.9
PIN	6	5.2	5.2	5.2	0.5	0.6	5.2	5.2	5.2	5.2
PIN	7	- 0.2	5.0	5.0	4.9	4.2	5.0	5.0	5.0	5.0
PIN	8	0	0	0	0	0	0	0	0	0
PIN	9	4.3	1.0	1.0	4.3	4.3	4.2	4.2	4.3	4.3
PIN	10	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
PIN	11	0.3	- 0.2	-0.2	0.3	4.4	3.4	3.4	3.5	3.4
PIN	12	0	0	0	0	0	0	0	0	0
PIN	13	4.3	1.0	1.0	4.3	4.4	4.2	4.2	4.3	4.3
PIN	14	0	0	0	0	0	0	0	0	0
PIN	15	4.3	4.3	4.3	4.4	4.3	4.3	4.3	4.3	4.3
PIN	16	5.2	5.2	5.2	5.2	5.1	5.2	5.2	5.2	5.2

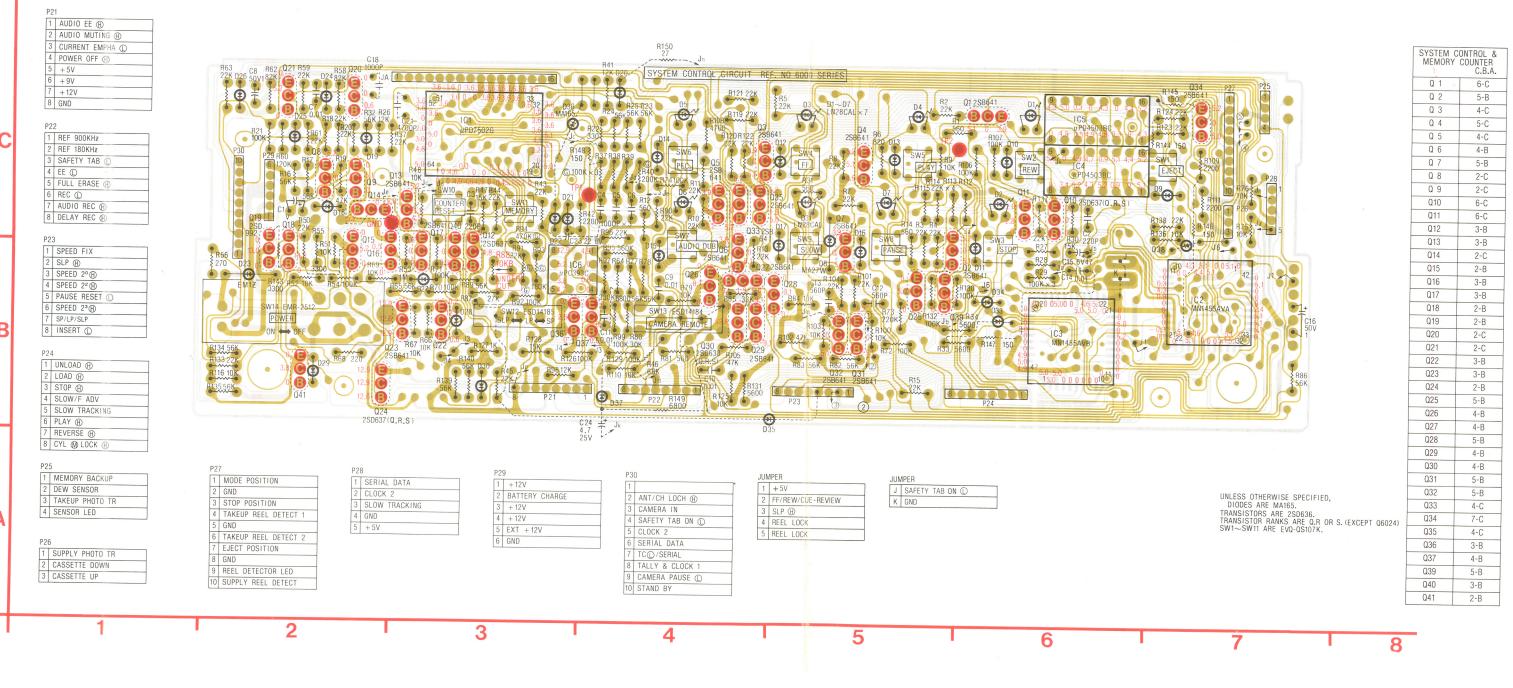
PIN NO.					IC6006				
PIN NU.	STOP	FF	REW	REC	PLAY	CUE	REV	SL0W(1.4)	FA
PIN 1	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
PIN 2	0	0	0	0	0	0	0	0	0
PIN 3	0.7	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6
PIN 4	0	0	0	0	0	0	0	0	0
PIN 5	4.7	4.6	4.6	4.7	4.6	4.6	4.6	4.6	4.6
PIN 6	3.7	3.7	3.7	3.8	3.7	3.7	3.7	3.8	3.7
PIN 7	5.2	5.1	5.1	5.2	5.2	5.1	5.1	5.2	5.1
PIN 8	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9

		STOP			FF		1	REW			REC			PLAY			CUE			REV			SLOW(1/4	,			
	E	В	С	E	В	С	-	B	С	-	I B	С	-	B			B	C							-	0	
Q6001	4.4	5.1	0	3.9	5.0	0	3.9	3.2	3,8	3.9	5.1	0	4.4		C	E 2.0	_	0	E	В	C	E	В	C	E	В	C
Q6002	5.2	4.0	5.1	5.1	5.1	-0.3	0	5.1	0.2				5.2	5.1	0	3.9	5.1	-	3.9	3.2	3.9	3.9	5.0	0	3.9	5.0	0
06003			0	3.9	3.2					3.9	5.1	0		5.1	0	5.2	5.1	0	5.2	5.1	0	5.2	5.1	0	5.2	0	0
06003	5.2	5.1	0	5.2	5.1	3.8	3.9 5.2	5.0	0		5.1	0	4.4	5.0	0	3.9	3.2	3.8	3.9	5.1	0	3.9	5.0	0	3.9	5.1	0
Q6005	4.4	5.0	0	3.9	5.0	0	3.9	5.0	0	3.9	4.5	5.1	5.2	4.5	5.1	5.2	4.5	5.1	5.2	4.5	5.1	5.2	4.5	5.1	5.2	4.5	5.1
Q6006	4.4	5.0	0	3.9	5.0	0	3.9	5.0	0	3.9	3.2 5.1	3.8	4.4	5.0	0	3.9	5.0	0	3.9	5.0	0	3.9	5.0	0	3.9	5.0	0
Q6007	4.8	5.1	0.1	3.9	5.0	0	3.9	2.8	0	3.9	5.1	0	4.4	5.0	0	3.9	5.0	0	3.9	5.0	0	3.9	5.0	0	3.9	5.0	0
Q6008	5.2	5.1	0.1	5.2	*	0	5.2	*	5.1	5.2	*	0	5.2		0	5.2		0	5.2	5.1	0	5.2	5.0 4.6	0	3.9 5.2	3.2	3.8
Q6009	0	0	5.1	0	0	5.1	0	0	5.0	0	0	5,1	0	0	5.1	0		5.1	0	0	5.1	0	0	5.1	0	<b>*</b>	5.1
Q6010	0	0	4.8	0	0	4.9	0	0	2.8	0	0	0	0	0	4.9	0	0	4.6	0	0	4.7	0	0	4.9	0	0	0
06011	0	0	3.4	0	0	2.8	0	0	4.8	0	0	2.8	0	0	3.4	0	0	2.8	0	0	2.8	0	0.6	0	0	0	2.8
06012	0	0.1	4.8	0	0	4.9	0	0	5.1	0	*	4.8	0	*	4.8	0	*	4.7	0	0	4.6	0	0.0	4.8	0	0.2	4.8
06013	5.2	4.5	5.2	5.2	4.5	5.2	5.2	4.5	0	5.2	4.5	5.1	5.2	4.5	5.2	5.2	4.5	5.1	5.2	4,5	5.1	5.2	4.5	5.1	5.2	4.5	5.2
06014	5.1	5.2	0	5.0	5.2	0.2	5.0	5.1	5.2	5.0	5.2	0	5.0	5.1	0	5.0	5.1	0/	5.0	5.1	0	5.0	5.2	0	5.0	5.2	0
06015	0	0	5.2	0	0	5.2	0	0	0.5	0.0	0.2	5.2	0	0	5.2	0.0	0	5.2	0	0	5.2	0	0	5,2	0	0	5.2
06016	0	0	0.5	0	0	0.5	0	0	0	0	0	0,5	0	0	0.5	0	0	0.5	0	0	0.5	0	0	0.5	0	0	0.5
06017	0.6	0.5	0	0.5	0.5	0	0.5	0.5	12.9	0.6	0.5	0	0.6	0.5	0	0.6	0.5	0	0.5	0.5	0	0.5	0.5	0.0	0.5	0.5	0.0
Q6018	0	0	13.0	0	0	12.9	0	0	12.9	0	0	13,0	0	0	12.9	0	0	12.9	0	0	12.9	0	0	12.9	0	0.0	12.9
06019	0	0	13.0	0	0	12.9	0	0	0	0	0	13.0	0	0	12,9	0	0	12.9	0	0	12.9	0	0	12.9	0	0	12.9
06020	0	0.6	0	0	0.6	0	0	0.6	5.1	0	0.6	0	0	0.6	0	0	0.6	0	0	0.6	0	0	0.6	0	0	0.6	0
Q6021	0	0	5.2	0	0	5.2	0	0	12.9	0	0	5.2	0	0	5.1	0	0	5.1	0	0	5.2	0	0	5.1	0	0	5.2
06022	0.2	0.5	13.0	0.1	0.5	12.9	0.1	0.5	12.6	0.2	0.6	12.9	0.1	0.6	12.9	0.1	0.6	12.9	0.1	0.5	12.9	0.1	0.5	12.9	0.2	0.6	12.9
06023	13.0	12.9	12.7	12.9	12.9	12.6	12.9	12.9	12.9	12.9	12.9	12.6	12.9	12.9	12.6	12.9	12.9	12.6	12.9	12.9	12.6	12.9	12.9	12.6	12.9	12.9	12.6
Q6024	13.0	12.7	13.0	12.6	12.6	12.9	12.9	12.6	5.0	12.9	12.6	12.9	12.9	12.6	5.0	12.9	12.6	12.9	12.9	12.6	12.9	12.9	12.6	12.9	12.9	12.6	12.9
Q6025	0	0	5.0	0	0	5.0	0	0	0	0	0	5.0	0	0	8.6	0	0	5.0	0	0	5.0	0	0	5.0	0	0	5.0
06026	0	0	8.6	0	0.6	0	0	0.6	9.0	0	0	8.7	0	0	1.8	0	0.6	0	0	0.6	0	0	0	8.6	0	0	8.0
Q6027	9.1	9.0	1.9	9.1	8.3	9.0	8.3	9.1	7.7	9.0	9.1	1.9	9.1	9.0	9.0	9.1	8.3	9.0	9.1	8.3	9.0	9.1	9.0	1.8	9.0	9.1	1.8
06028	0	0	9.1	0	0	7.6	0	0	4.6	0	0	9.1	0	0	*	0	0	7.7	0	0	7.7	0	0	9.0	0	0	9.0
Q6029	9.1	9.1	0	9.1	8.6	4.7	9.1	8.7	12.9	9.1	9.1	*	9.1	9.0	12.9	9.1	8.7	4.8	9.1	8.7	4.6	9.1	9.0	0	9.1	9.0	*
Q6030	0	0	1.3	0.1	0.1	12.9	0	0.1	0	1.0	*	12.9	*	*	0	0	0.1	12.9	0	0	12.9	*	*	12.9	*	*	12.9
Q6031	5.2	5.2	0	5.2	*	0	5.1	5.1	0	5.2	5.1	0	5.2	5.1	0	5.2	5.1	0	5.2	5.1	0	5.2	5.1	0	5.2	5.1	0
06032	5.2	5.2	0	5.2	5.1	0	5.2	5.1	0	5.2	5.1	0	5.2	5.1	0	5.2	5.1	0	5.2	5.1	0	5.2	5.1	0	5.2	5.1	0
06033	5.2	5.1	0	5.2	5.1	0	5.2	0.1	0	5.2	5.2	0	5.2	5.1	0	5.2	5.1	0	5.2	5.1	0	5.2	5.1	0	5.2	5.1	0
06034	5.2	5.0	0	5.2	5.0	0	5.2	5.0	0	5.2	5.0	0	5.2	5.0	0	5.2	5.0	0	5.2	5.0	0	5.2	5.2	0	5.2	5.0	0
06035	5.2	5.0	- 0.1	5.2	5.0	1.3	5.2	5.0	0	5.2	5.0	1.3	5.2	5.0	1.2	5.2	5.0	1.2	5.2	5.0	0	5.2	5.0	0	5.2	5.0	1.3
Q6036	0	0	4.7	0	0	4.7	0	0	4.7	0	0	2.6	0	0.6	0	0	0.6	0	0	0.6	0	0	0.6	0	0	6.0	0
06037	0	0	4.7	0	0	4.7	0	0	4.7	0	0.6	0	0	0	0.4	0	0	0.3	0	0	0.4	0	0	0.3	0	0	0.3
06039	0	0.6	0	0	0.6	0	0	0.6	0	0	0	4.3	0	0	4.4	0	0	4.4	0	0	4.4	0	0	4.0	0	0	4.0
06040	0	0.3	0	0	0.2	0	0	0.2	0	0	0.3	0	0	0.3	0	0	0.3	0	0	0.3	0	0	0	4.0	0	0.3	0
06041	0	0	10.9	0	0	10.8	0	0	10.8	0	0	3.8	0	0	3.8	0	0	3.8	0	0	10.9	0	0	10.8	0	0	10.8

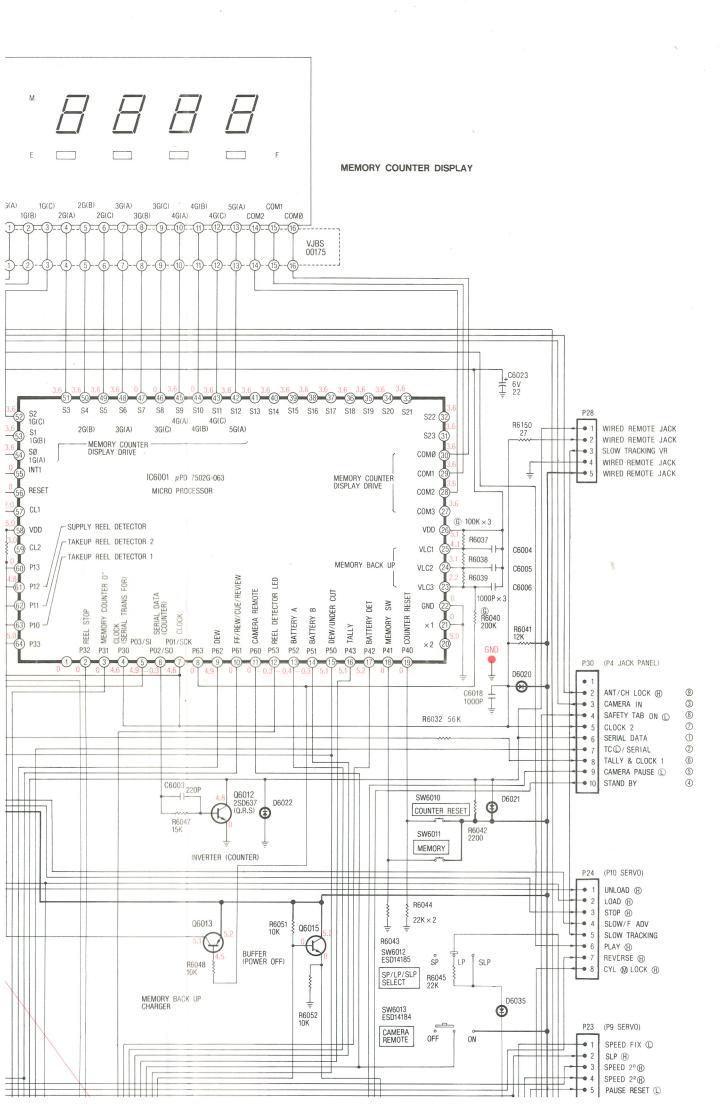
# SYSTEM CONTROL & MEMORY COUNTER C.B.A. (VEPS0648A)

THE VOLTAGE MEASUREMENTS GIVEN IN THIS DRAWING ARE COLOR BAR SIGNAL IN SP-REC MODE.





### SYSTEM CONTROL & MEMORY COUNTER SCHEMATIC DIAGRAM THE VOLTAGE MEASUREMENTS GIVEN IN THIS DRAWING ARE COLOR BAR SIGNAL IN SP-REC 1G(C) 1G(B) (B) 3G(A) 2G(C) 3 5G(A) 2G(A) 3G(B) 4G(A) 4G(C) COM2 COMØ CH UP/ANTENNA VOLTAGE SELECT (P8 A.V.R.) P22 REE 900KHz REF 180KHz SAFETY TAB ( R6126 Q6036 100K EE ① R6129 Q6037 100K 0.6 EJECT STOP FF REW PLAY AUDIO DUB FULL ERASE (H) PAUSE REC (L) SW6001 SW6003 SW6004 SW6005 SW6006 SW6007 R6140 56K AUDIO REC (H) R6130 | 100K \( \) Q6039 DELAY REC (H) D6009 D6011 D6012 D6014 D6015 D6017 **(4) (4) ( ( ( ( (1) (4) (** R6132 } (SAFETY TAB SW) SAFETY TAB ON () J •-S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 S15 4G(A) 4G(C) GND K ● PLAY (1) INHIBIT 3G(A) 3G(C) 4G(B) - MEMORY COUNTER -DISPLAY DRIVE IC6001 µPD 7502G-063 MICRO PROCESSOR LED DRIVERS R6050 22K 5 Q6014 0 E -SUPPLY REEL DETECTOR VDD MA27WA R6148 150 - TAKEUP REEL DETECTOR 2 <del>(1)</del> D6031LN28CAL R6023 56K Q6005 Q6006 Q6007 ≥ SLOW 5.1 R6005 22K 5. R6024 56K D6018 R6017 R6010 5 R6003 . 22K R6019 47K R6025 56K R6013 22K R6015 22K D6004 ≥ **(4)** D6007 R6016 56K \**®** ≥⊕ 06008 REW PLAY D6006 D6019 AUDIO DOB D6005 D6003 PAUSE STOP R6014 560 1 50V MICRO PROCESSOR RESET 50V\_+ R 6034 5600 R6033 5600 D04 D03 D02 D01 D00 INVERTER (COUNTER) Q6034 Q6035 E02 UNLOADING R6123 22K R6120 22 Q6010 2SD637 = (Q.R.S) INVERTER INVERTER Q6013 R6051 10K IC 6002 MN1455AVA IC6003 MN1455AVB STOP-EJECT MICRO PROCESSOR MICRO PROCESSOR BUFFER (POWER OFF) D AUDIO FE MEMORY BACK UP CHARGER CO9 TALLY R6114 R6113 42) cos CO7 CO6 CO5 CO4 CO3 CO2 CO1 COØ AI3 AI2 R6112 22K×4





	P21 (SYSTEM CONTROL & MEMORY COUNTER C.B.A.)									
PIN NO.	SIGNAL NAME	DESTINATION								
1	AUDIO EE (H)	P7-1 A.V.R. C.B.A.								
2	AUDIO MUTING (H)	P7-2 A.V.R. C.B.A.								
3	CURRENT EMPHA (	P7-3 A.V.R. C.B.A.								
4	POWER OFF (H)	P7-4 A.V.R. C.B.A.								
5	+5V	P7-5 A.V.R. C.B.A.								
6	+9V	P7-6 A.V.R. C.B.A.								
7	+12V	P7-7 A.V.R. C.B.A.								
8	GND	P7-8 A.V.R. C.B.A.	l .							

	P22 (SYSTEM CONTR	OL & MEMORY COUNTER C.B.A.)
PIN NO.	SIGNAL NAME	DESTINATION
1	REF 900KHz	P8-1 A.V.R. C.B.A.
2	REF 180KHz	P8-2 A.V.R. C.B.A.
3	SAFETY TAB (	P8-3 A.V.R. C.B.A.
4	EE ①	P8-4 A.V.R. C.B.A.
5	FULL ERASE (H)	P8-5 A.V.R. C.B.A.
6	REC ①	P8-6 A.V.R. C.B.A.
7	AUDIO REC (H)	P8-7 A.V.R. C.B.A.
8	DELAY REC (H)	P8-8 A.V.R. C.B.A.

	P23 (SYSTEM CONTROL & MEMORY COUNTER C.B.A.)									
PIN NO.	SIGNAL NAME	DESTINATION								
1	SPEED FIX	P9-1 SERVO C.B.A.								
2	SLP (H)	P9-2 SERVO C.B.A.								
3	SPEED 2° (H)	P9-3 SERVO C.B.A.								
4	SPEED 22 H	P9-4 SERVO C.B.A.								
5	PAUSE RESET ①	P9-5 SERVO C.B.A.								
6	SPEED 23 H	P9-6 SERVO C.B.A.								
7	SP/LP/SLP	P9-7 SERVO C.B.A.								
8	INSERT (	P9-8 SERVO C.B.A.								

	P24 (SYSTEM CONTR	OL & MEMORY COUNTER C.B.A.)
PIN NO.	SIGNAL NAME	DESTINATION
1	UNLOAD (H)	P10-1 SERVO C.B.A.
2	LOAD (H)	P10-2 SERVO C.B.A.
3	STOP (H)	P10-3 SERVO C.B.A.
4	SLOW/FADV	P10-4 SERVO C.B.A.
5	SLOW TRACKING	P10-5 SERVO C.B.A.
6	PLAY (H)	P10-6 SERVO C.B.A.
7	REVERSE (H)	P10-7 SERVO C.B.A.
8	CAT W FOCK (H)	P10-8 SERVO C.B.A.

P25 (SYSTEM CONTROL & MEMORY COUNTER C.B.A.)		
PIN NO.	SIGNAL NAME	DESTINATION
1	MEMORY BACKUP	P38-1 SUB SYSTEM CONTROL C.B.A.
2	DEW SENSOR	P38-2 SUB SYSTEM CONTROL C.B.A.
3	TAKEUP PHOTO TR	P38-3 SUB SYSTEM CONTROL C.B.A.

# 4-15 SYSTEM CONTROL & MEMORY COUNTER SCHEMATIC DIAGRAM

CALLOUTS NEXT TO WIRING PLUGS INDICATE CONNECTIONS TO OTHER SCHEMATIC DIAGRAM.

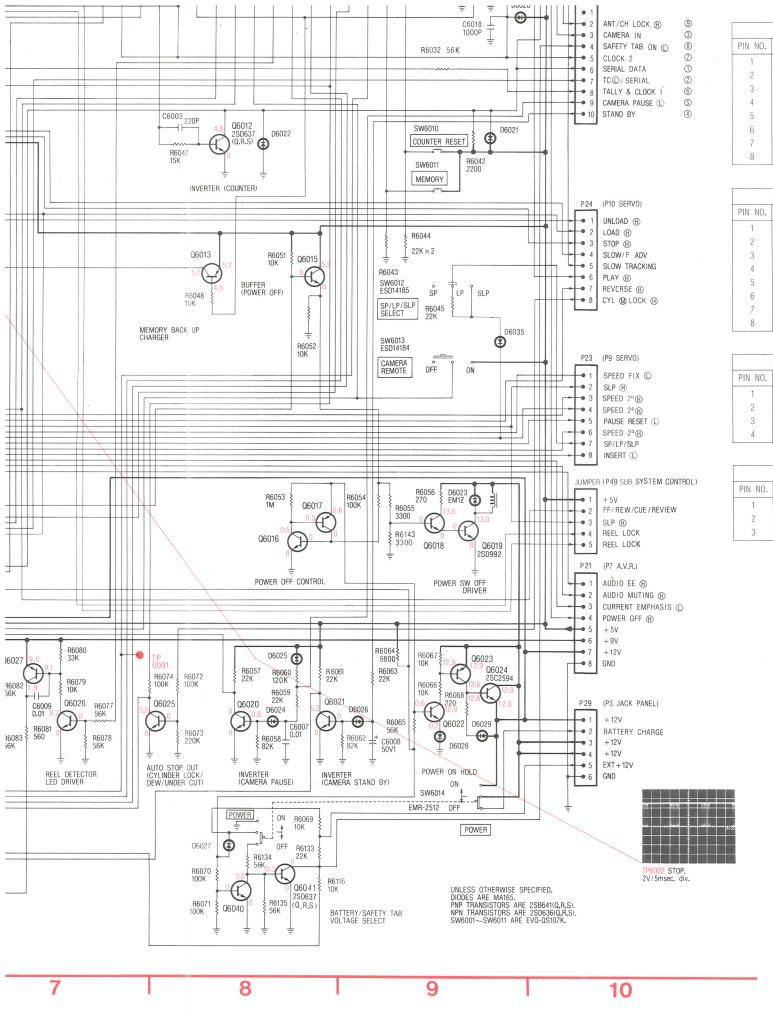
	P27 (SYSTEM CONTROL & MEMORY COUNTER C.B.A.)		
PIN NO.	SIGNAL NAME	DESTINATION	
1	MODE POSITION	P43-4 MODE SWITCH	
2	GND	P43-1 MODE SWITCH	
3	STOP POSITION	P43-2 MODE SWITCH	
4	TAKEUP REEL DETECT 1	P42-4 TAKEUP REEL DETECTOR C.B.A.	
5	GND	P42-2 TAKEUP REEL DETECTOR C.B.A.	
6	TAKEUP REEL DETECT 2	P42-1 TAKEUP REEL DETECTOR C.B.A.	
7	EJECT POSITION	P43-3 MODE SWITCH	
8	GND	P39-2 SUPPLY REEL DETECTOR C.B.A.	
9	REEL DETECTOR LED	P39-3 SUPPLY REEL DETECTOR C.B.A.	
10	SUPPLY REEL DETECT	P39-1 SUPPLY REEL DETECTOR C.B.A.	

P28 (SYSTEM CONTROL & MEMORY COUNTER C.B.A.)		
PIN NO.	SIGNAL NAME	DESTINATION
1	SERIAL DATA	4 WIRED REMOTE JACK C.B.A.
2	CLOCK 2	2 WIRED REMOTE JACK C.B.A.
3	SLOW TRACKING	SLOW TRACKING VR
4	GND	3 WIRED REMOTE JACK C.B.A.
5	+5V	1 WIRED REMOTE JACK C.B.A.

	P29 (SYSTEM CONTROL & MEMORY COUNTER C.B.A.)		
PIN NO.	SIGNAL NAME	DESTINATION	
1	+ 12V	P3-1 JACK PANEL C.B.A.	
2	BATTERY CHARGE	P3-4 JACK PANEL C.B.A.	
3	+12V	P3-5 JACK PANEL C.B.A.	
4	+12V	P3-6 JACK PANEL C.B.A.	
5	EXT +12V	P3-2 JACK PANEL C.B.A.	
6	GND	P3-3 JACK PANEL C.B.A.	

P30 (SYSTEM CONTROL & MEMORY COUNTER C.B.A.)		
PIN NO.	SIGNAL NAME	DESTINATION
1		
2	ANT/CH LOCH (H)	P4-9 JACK PANEL C.B.A.
3	CAMERA IN	P4-3 JACK PANEL C.B.A.
4	SAFETY TAB ON ①	P4-8 JACK PANEL C.B.A.
5	CLOCK 2	P4-7 JACK PANEL C.B.A.
6	SERIAL DATA	P4-1 JACK PANEL C.B.A.
7	TC/SERIAL (	P4-2 JACK PANEL C.B.A.
8	TALLY & CLOCK 1	P4-6 JACK PANEL C.B.A.
9	CAMERA PAUSE ①	P4-5 JACK PANEL C.B.A.
10	STAND BY	P4-4 JACK PANEL C.B.A.

	JUMPER (SYSTEM CO	NTROL & MEMORY COUNTER C.B.A.)
PIN NO.	SIGNAL NAME	DESTINATION
J	SAFETY TAB	P50-1 SAFETY TAB SWITCH C.B.A.
Κ.	GND	P50-2 SAFETY TAB SWITCH C.B.A.



	P23 (SYSTEM CONTROL & MEMORY COUNTER C.B.A.)		
PIN NO.	SIGNAL NAME	DESTINATION	
1	SPEED FIX	P9-1 SERVO C.B.A.	
2	SLP (H)	P9-2 SERVO C.B.A.	
3	SPEED 2° ⊞	P9-3 SERVO C.B.A.	
4	SPEED 22 H	P9-4 SERVO C.B.A.	
5	PAUSE RESET (	P9-5 SERVO C.B.A.	
6	SPEED 23 H	P9-6 SERVO C.B.A.	
7	SP/LP/SLP	P9-7 SERVO C.B.A.	
8	INSERT (	P9-8 SERVO C.B.A.	

	P24 (SYSTEM CONTROL & MEMORY COUNTER C.B.A.)		
PIN NO.	SIGNAL NAME	DESTINATION	
1	UNLOAD (H)	P10-1 SERVO C.B.A.	
2	LOAD (H)	P10-2 SERVO C.B.A.	
3	STOP (H)	P10-3 SERVO C.B.A.	
4	SLOW/FADV	P10-4 SERVO C.B.A.	
5	SLOW TRACKING	P10-5 SERVO C.B.A.	
6	PLAY (H)	P10-6 SERVO C.B.A.	
7	REVERSE (H)	P10-7 SERVO C.B.A.	
8	CAT W TÓCK H	P10-8 SERVO C.B.A.	

P25 (SYSTEM CONTROL & MEMORY COUNTER C.B.A.)		
PIN NO.	SIGNAL NAME	DESTINATION
1	MEMORY BACKUP	P38-1 SUB SYSTEM CONTROL C.B.A.
2	DEW SENSOR	P38-2 SUB SYSTEM CONTROL C.B.A.
3	TAKEUP PHOTO TR	P38-3 SUB SYSTEM CONTROL C.B.A.
4	SENSOR LED	P38-4 SUB SYSTEM CONTROL C.B.A.

	P26 (SYSTEM CONTROL & MEMORY COUNTER C.B.A.)		
PIN NO.	SIGNAL NAME	DESTINATION	
1	SUPPLY PHOTO TR	P41-2 SUPPLY PHOTO TR C.B.A.	
2	CASSETTE DOWN	P41-1 SUPPLY PHOTO TR C.B.A.	
3	CASSETTE UP	P41-3 SÜPPLY PHOTO TR C.B.A.	

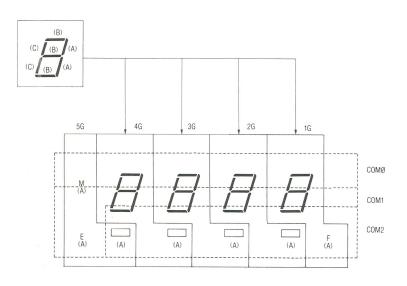
	P29 (SYSTEM CONTROL & MEMORY COUNTER C.B.A.)		
PIN NO.	SIGNAL NAME	DESTINATION	
1	+12V	P3-1 JACK PANEL C.B.A.	
2	BATTERY CHARGE	P3-4 JACK PANEL C.B.A.	
3	+12V	P3-5 JACK PANEL C.B.A.	
4	+12V	P3-6 JACK PANEL C.B.A.	
5	EXT +12V	P3-2 JACK PANEL C.B.A.	
6	GND	P3-3 JACK PANEL C.B.A.	

P30 (SYSTEM CONTROL & MEMORY COUNTER C.B.A.)		
PIN NO.	SIGNAL NAME	DESTINATION
1		
2	ANT/CH LOCH (H)	P4-9 JACK PANEL C.B.A.
3	CAMERA IN	P4-3 JACK PANEL C.B.A.
4	SAFETY TAB ON ①	P4-8 JACK PANEL C.B.A.
5	CLOCK 2	P4-7 JACK PANEL C.B.A.
6	SERIAL DATA	P4-1 JACK PANEL C.B.A.
7	TC/SERIAL (	P4-2 JACK PANEL C.B.A.
8	TALLY & CLOCK 1	P4-6 JACK PANEL C.B.A.
9	CAMERA PAUSE (	P4-5 JACK PANEL C.B.A.
10	STAND BY	P4-4 JACK PANEL C.B.A.

	JUMPER (SYSTEM COI	NTROL & MEMORY COUNTER C.B.A.)
PIN NO.	SIGNAL NAME	DESTINATION
J	SAFETY TAB	P50-1 SAFETY TAB SWITCH C.B.A.
Κ .	GND	P50-2 SAFETY TAB SWITCH C.B.A.

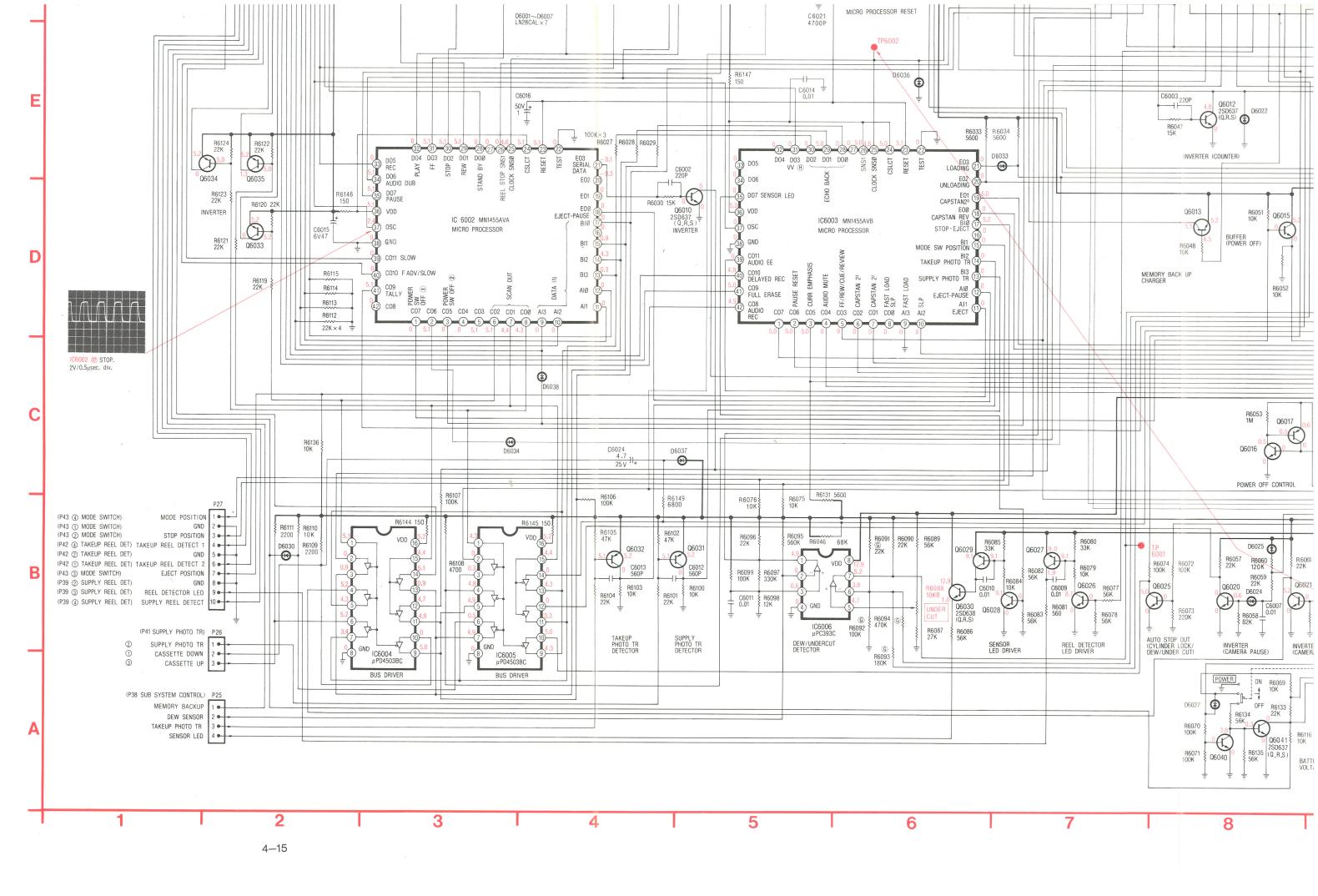
	JUMPER (SYSTEM COM	ITROL & MEMORY COUNTER C.B.A.)
PIN NO.	SIGNAL NAME	DESTINATION
1	+ 5V	P49-1 SUB SYSTEM CONTROL C.B.A.
2		4
3	SLP (H)	P49-3 SUB SYSTEM CONTROL C.B.A.
4	REEL LOCK	P49-4 SUB SYSTEM CONTROL C.B.A.
5	REEL LOCK	P49-5 SUB SYSTEM CONTROL C.B.A.

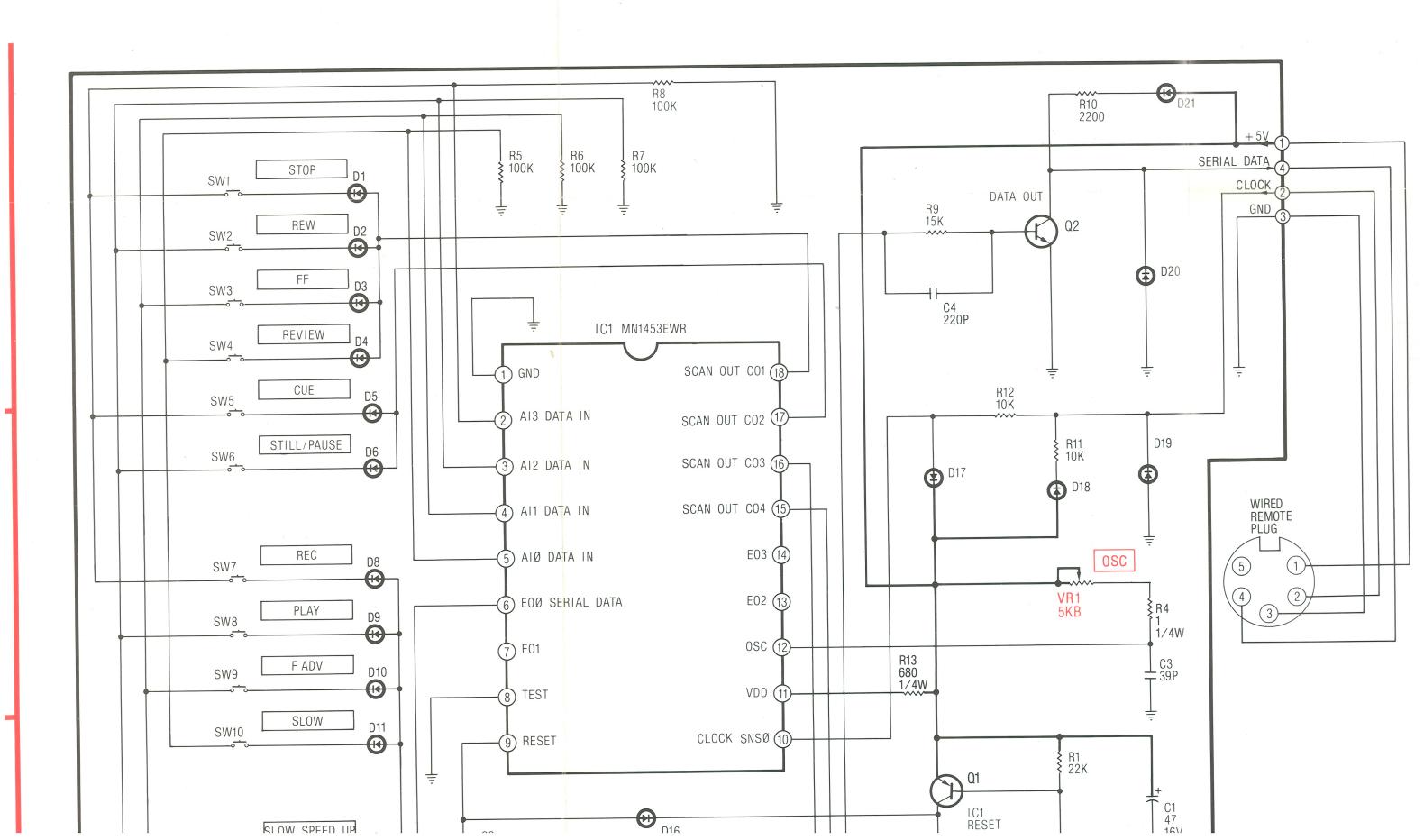
### MEMORY COUNTER CONNECTION CHART

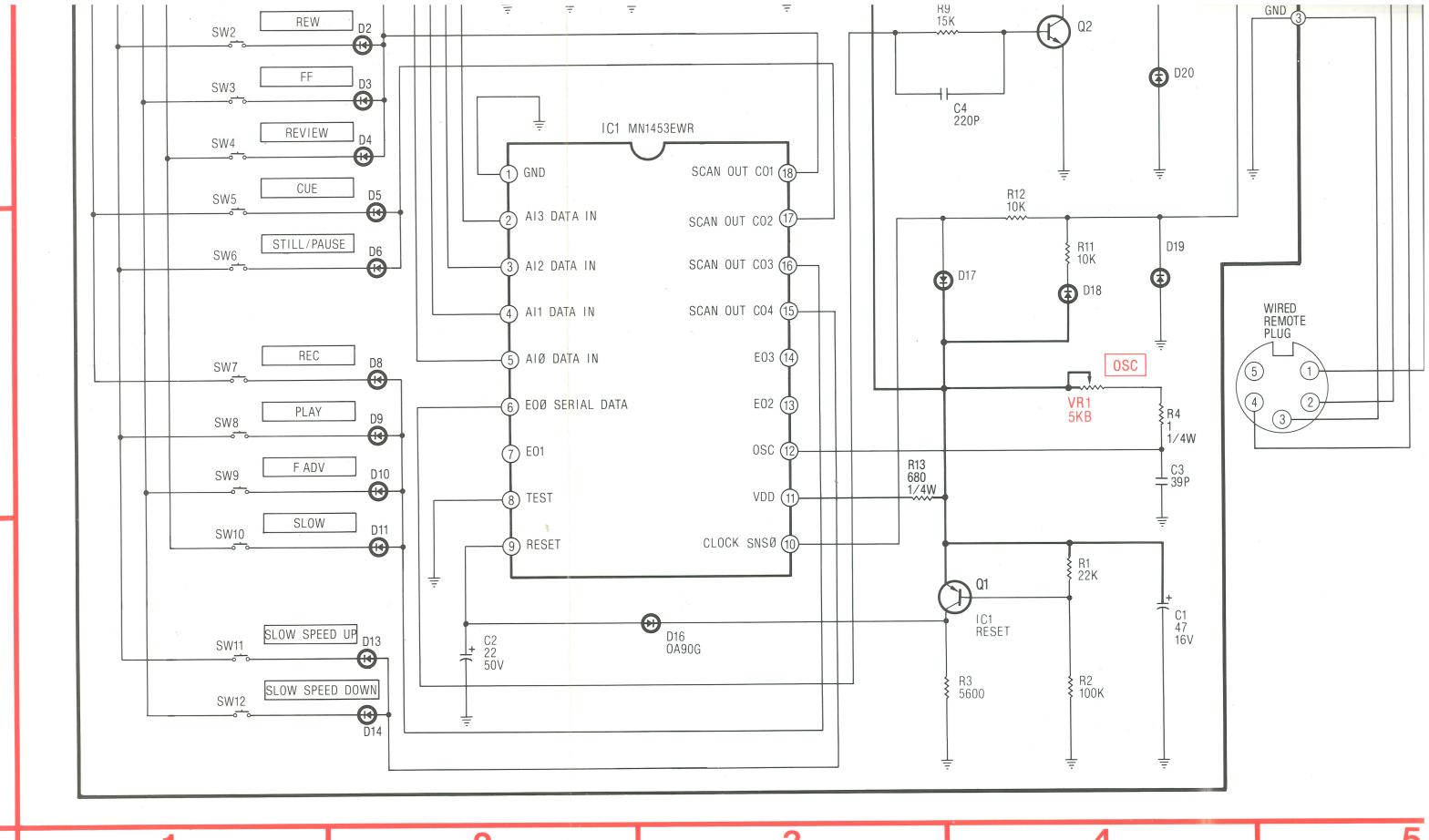


PIN NO.	1	2	3	4	5	6	7	8	9	10
SIGNAL NAME	1G(A)	1G(B)	1G(C)	2G(A)	2G(B)	2G(C)	3G(A)	3G(B)	3G(C)	4G(A)
PIN NO.	11	12	13	14	15	16				
SIGNAL NAME	4G(B)	4G(C)	5G(A)	COM2	COM1	COMO				

4-16 WIRED TRANSMITTER CIRCUIT

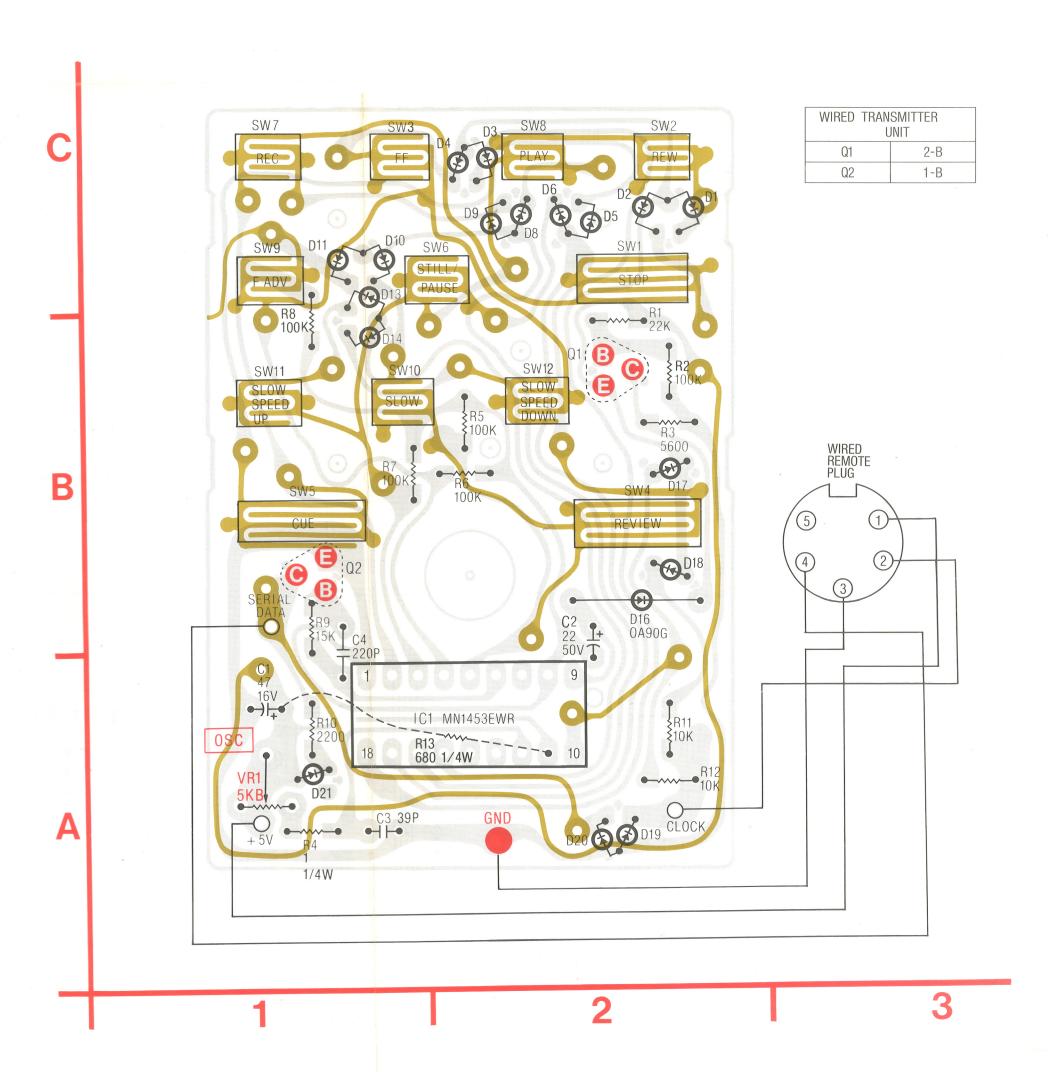






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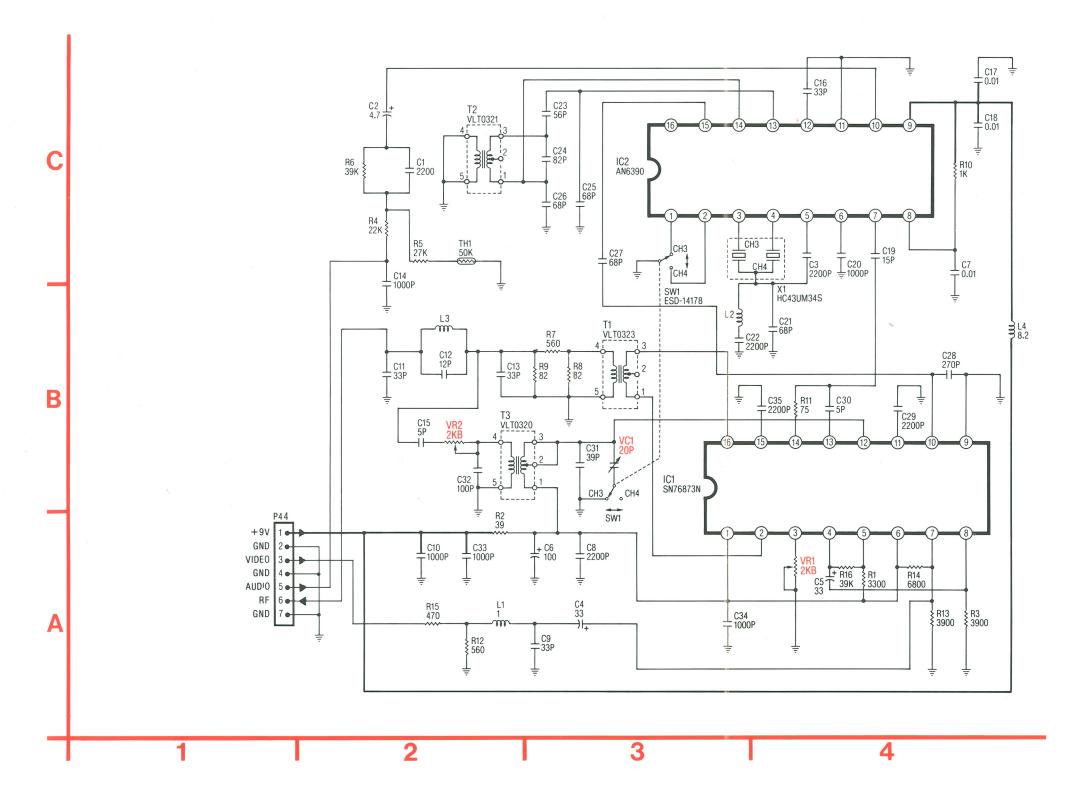
# WIRED TRANSMITTER UNIT

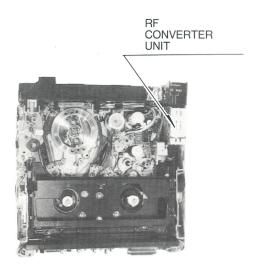


4-16

# RF CONVERTER UNIT SCHEMATIC DIAGRAM (ENC16501)

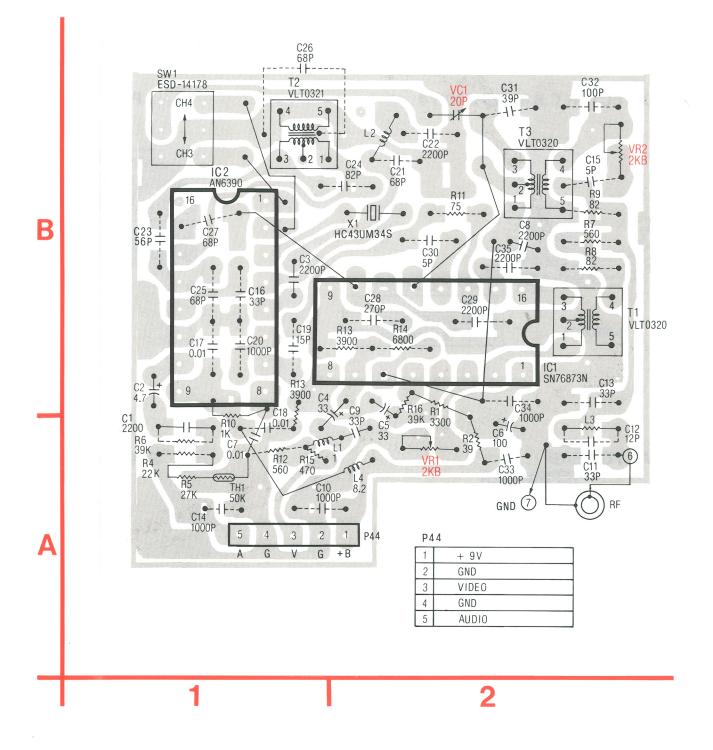
IMPORTANT NOTICE:
IF UNIT PARTS ARE REPLACED INDIVIDUALLY, THE FCC SPECIFICATIONS WILL NOT BE SATISFIED.
DURING SERVICING, PLEASE REPLACE AS A UNIT.





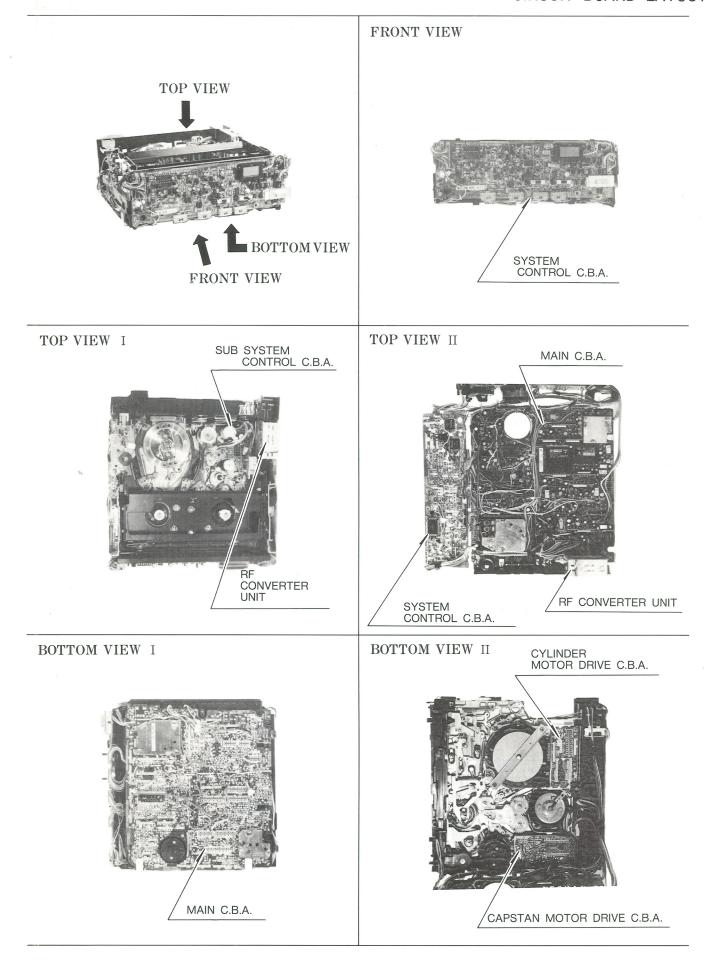
# **RF CONVERTER UNIT (ENC16501)**

IMPORTANT NOTICE:
IF UNIT PARTS ARE REPLACED INDIVIDUALLY, THE FCC SPECIFICATIONS WILL NOT BE SATISFIED.
DURING SERVICING, PLEASE REPLACE AS A UNIT.

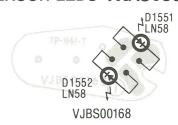


# CIRCUIT BOARD LAYOUT

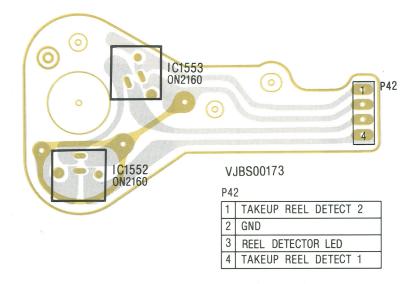
# 4-17 RF CONVERTER CIRCUIT CIRCUIT BOARD LAYOUT



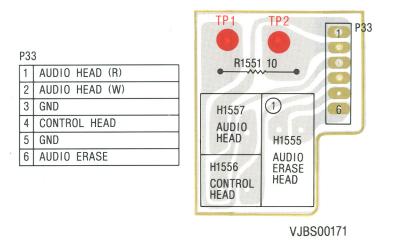
### SENSOR LEDS VXAS0300



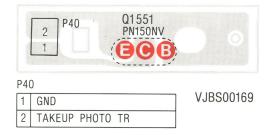
### TAKEUP REEL DETECTOR C.B.A. VEPS00173



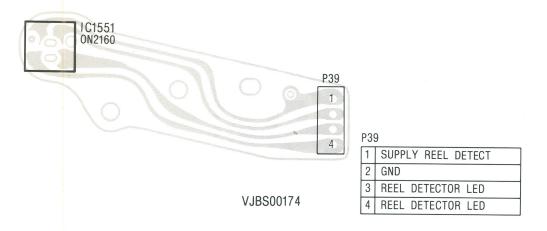
### AUDIO/CONTROL HEAD VEHS0034



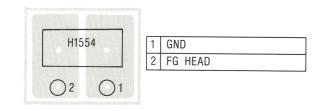
### TAKEUP PHOTO TR C.B.A. VUPS0006



### SUPPLY REEL DETECTOR C.B.A. VEPS00174



### CAPSTAN FG HEAD VEPS00172A



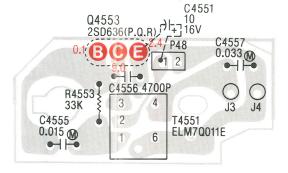
VJBS00172

### SUPPLY PHOTO TR C.B.A. VUPS0007



P4		VJBS00170
1	CASSETTE DOWN	J1 → CASSETTE UP SW
2	SUPPLY PHOTO TR	J2 → CASSETTE DOWN SV
3	CASSETTE UP	

### FULL ERASE HEAD C.B.A. VEPS0408A



THE VOLTAGE MEASUREMENTS GIVEN IN THIS DRAWING ARE COLOR BAR SIGNAL IN SP-REC MODE.

P48	3		
1	FULL	ERASE	
2	GND		

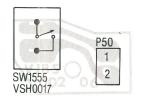
VJBS0408

 E
 B
 C
 E
 B
 C
 E
 B
 C

 Q4553
 1.0
 0.2
 0.2
 2.4
 0.1
 9.0
 0
 0
 0

 VOLTAGE MEASUREMENTS: COLOR BAR SIGNAL IN SP MODE.

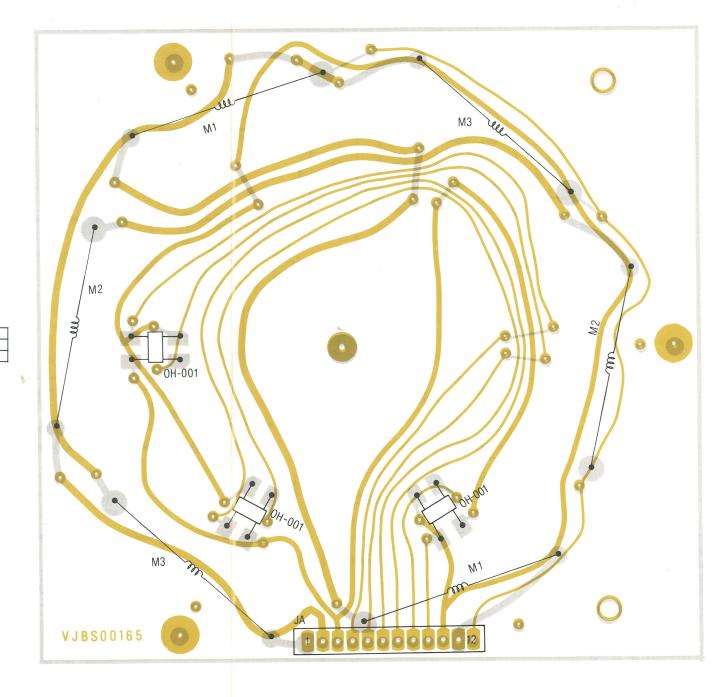
SAFETY TAB SWITCH C.B.A. VEKS0881



P50	
1	SAFETY TAB
2	GND

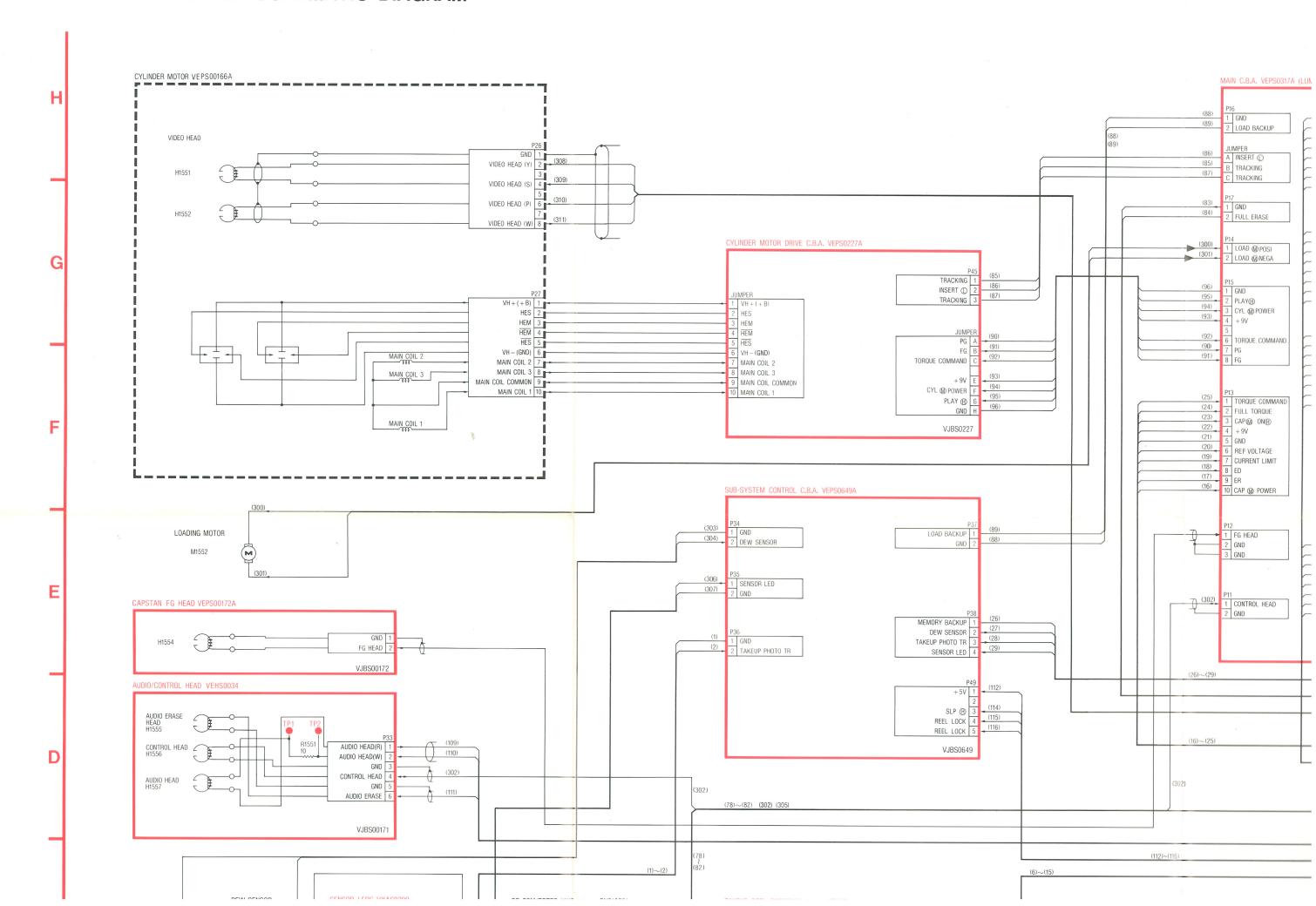
VJBS00206

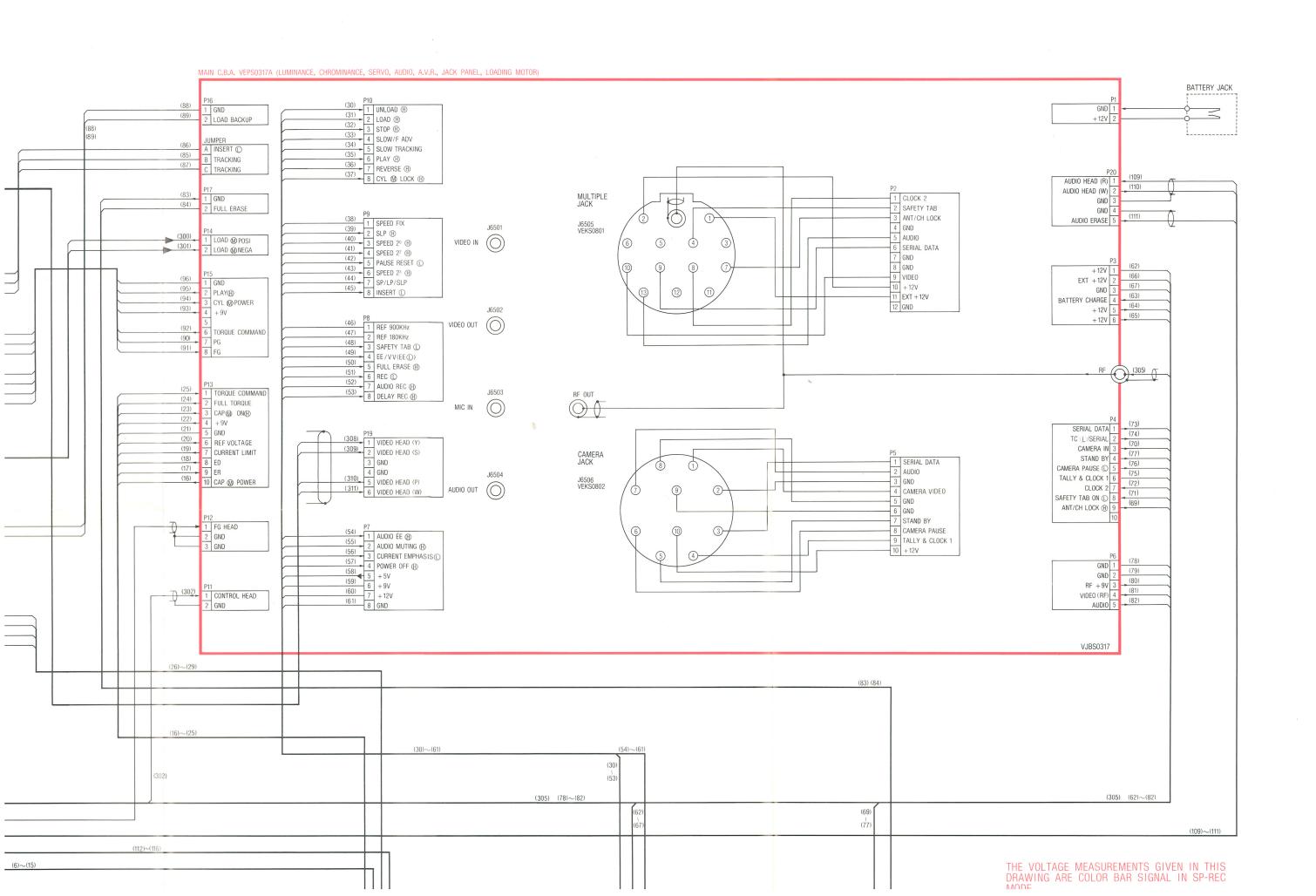
### CAPSTAN STARTER COIL ASS'Y VEMSO025

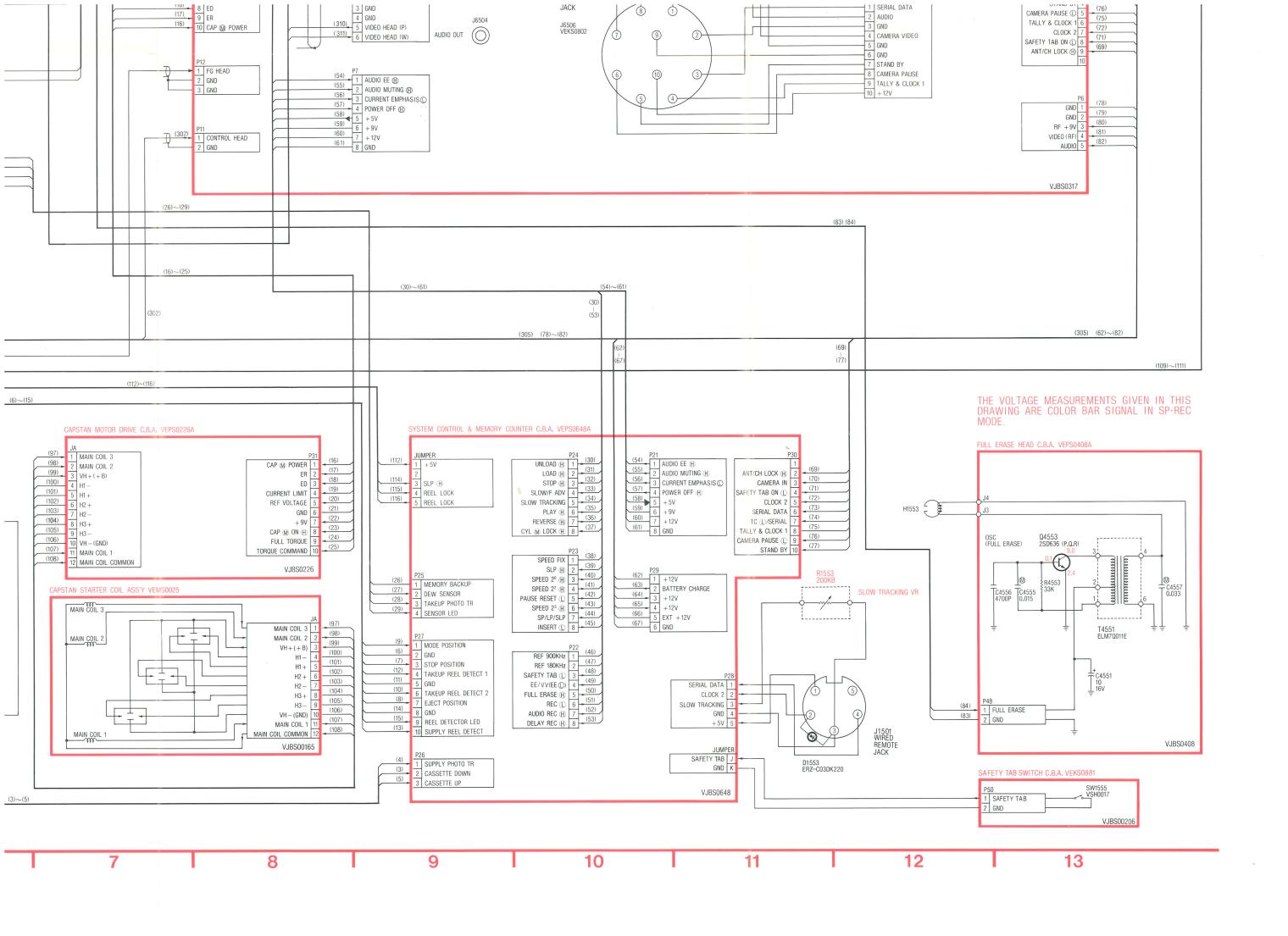


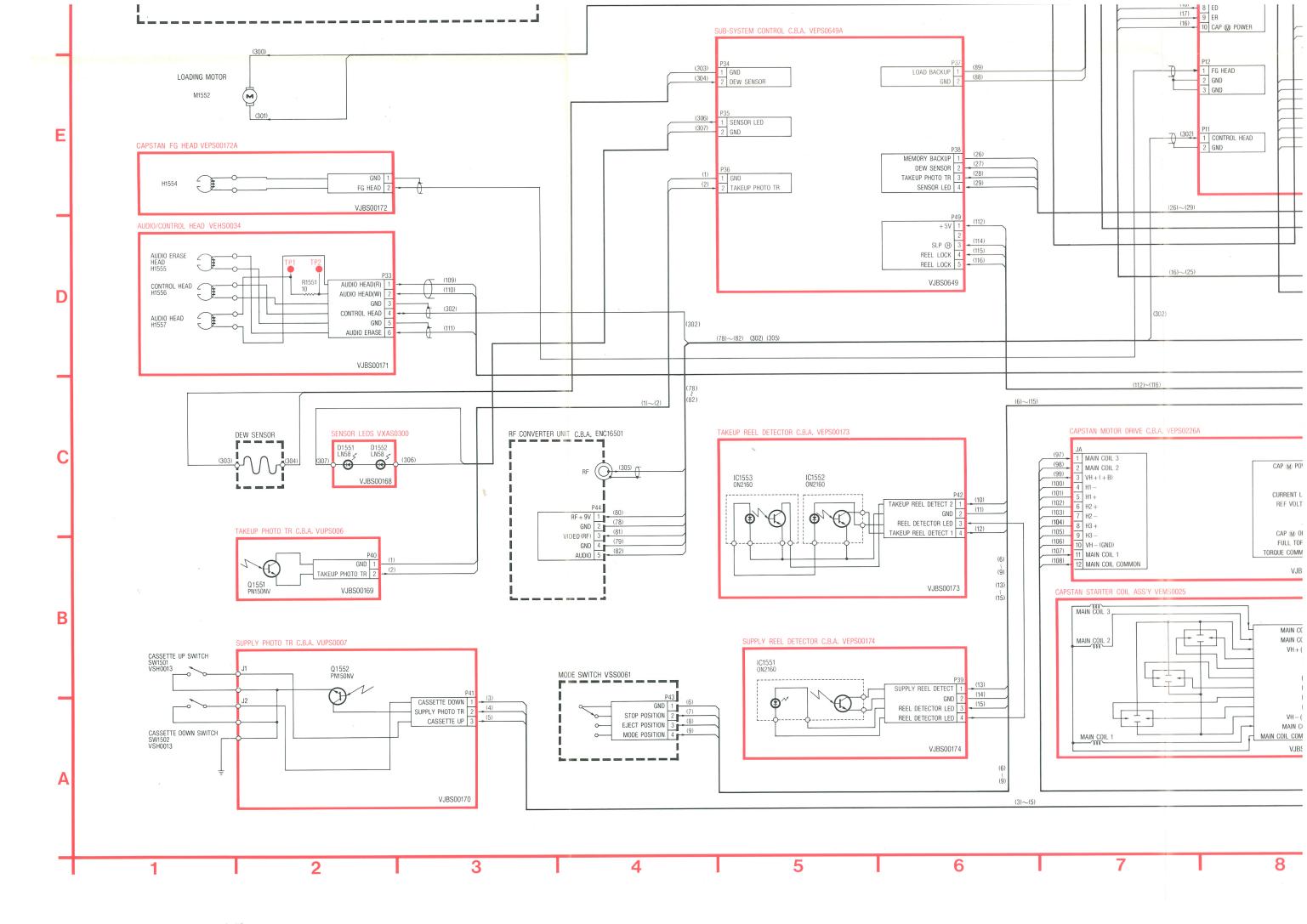
JA	
1	MAIN ĆOIL 3
2	MAIN COIL 2
3	VH + ( + B)
4	H1 —
5	H1 +
6	H2 +
7	H2 —
8	H3 +
9	H3 —
10	VH — (GND)
11	MAIN COIL 1
12	MAIN COIL COMMON

# INTERCONNECTION SCHEMATIC DIAGRAM









# Service Manual

Vol. 5

Exploded Views
Replacement Parts List

Panasonic VHS Omnivision PV-5000

Portable Video Cassette Recorder



#### **SPECIFICATIONS**

Power Source: 12VDC

Battery LCS-2012P Elec. Tuner Unit PV-A200 Prog. Tuner Unit PV-A500 Multiple AC Adaptor PV-A100 Plug-in AC Adaptor PV-A110

Power Consumption: Approx. 7W at Play mode

Television System: EIA Standard (525 lines, 60 fields)

NTSC color signal

Video Recording

System: 2 rotary heads helical scanning system

Luminance: FM azimuth recording Chrominance: Converted subcarrier phase shift recording

Audio Track: 1 track

Tape Format: Tape width 1/2" (12.7 mm), high density

tape

Tape Speed: SP mode: 1-5/16 i.p.s (33.35 mm/s)

LP mode: 21/32 i.p.s (16.67 mm/s) SLP mode: 7/16 i.p.s (11.12 mm/s) 360 min, with NV-T120 used in SL

Record/Playback Time: 360 min. with NV-T120 used in SLP

mode

 $FF/REW\ Time: \qquad \qquad Less\ than\ 6\ min.\ with\ NV-T120$ 

Heads: Video: 2 Rotary heads

 $Audio/Control \hbox{:}\ 1\ stationary\ head$ 

Erase: 1 full track erase

1 audio track erase for audio

dubbing

Input Level: Video: VIDEO IN Jack (RCA type)

 $1.0\,\mathrm{Vp}$ -p,  $75\Omega$  unbalanced

Audio: MIC IN Jack

 $-70\,\text{dB},\,600\Omega$  unbalanced

Output Level: Video: VIDEO OUT Jack (RCA type)

 $1.0\,\mathrm{Vp}$ -p,  $75\,\Omega$  unbalanced Audio: AUDIO OUT Jack (RCA type)

 $-6\,\mathrm{dB}$ ,  $600\Omega$  unbalanced

RF Modulated: Ch3/Ch4 switchable, 72dBμ (open voltage),

75Ω unbalanced

Video Horizontal

Resolution: More than 230 lines

Audio Frequency

Response: SP:  $100 \text{ Hz} \sim 8 \text{ kHz}$ , (10 dB down) LP:  $100 \text{ Hz} \sim 6 \text{ kHz}$ ,

SLP:  $150 \text{ Hz} \sim 5 \text{ kHz}$ 

Signal-to-Noise Ratio: Video: SP mode: better than 40 dB

LP mode: better than 40dB SLP mode: better than 40dB SLP mode: better than 40dB (Rohde & Schwarz noise meter) Audio: SP mode: better than 42dB

LP mode: better than 40dB SLP mode: better than 40dB

Operating

Temperature:  $32^{\circ}F \sim 104^{\circ}F$  ( $0^{\circ}C \sim 40^{\circ}C$ )

Operating Humidity: 10% ~ 75%

Weight: 8.4 lbs (3.8 kg) (with internal battery pack)

Dimensions:  $9-3/8 \text{ "(W)} \times 3-5/8 \text{ "(H)} \times 9-9/16 \text{ "(D)}$ 

 $238(W) \times 92.5(H) \times 242(D) mm$ 

Weight and dimensions shown are approximate. Specifications are subject to change without notice.

# **Panasonic**

Panasonic Company Division of Matsushita Electric Corporation of America One Panasonic Way, Secaucus, New Jersey 07094

Panasonic Hawaii Inc. 91-238 Kauhi St. Ewa Beach P.O. Box 774 Honolulu, Hawaii 96808-0774

Panasonic Canada Division of Matsushita Electric of Canada Limited 5770 Ambler Drive, Mississauga Ontario, L4W 2T3 Panasonic Sales Company, Division of Matsushita Electric of Puerto Rico, Inc. Ave, 65 De Infanteria, KM 9.7 Victoria Industrial Park Carolina, Puerto Rico 00630

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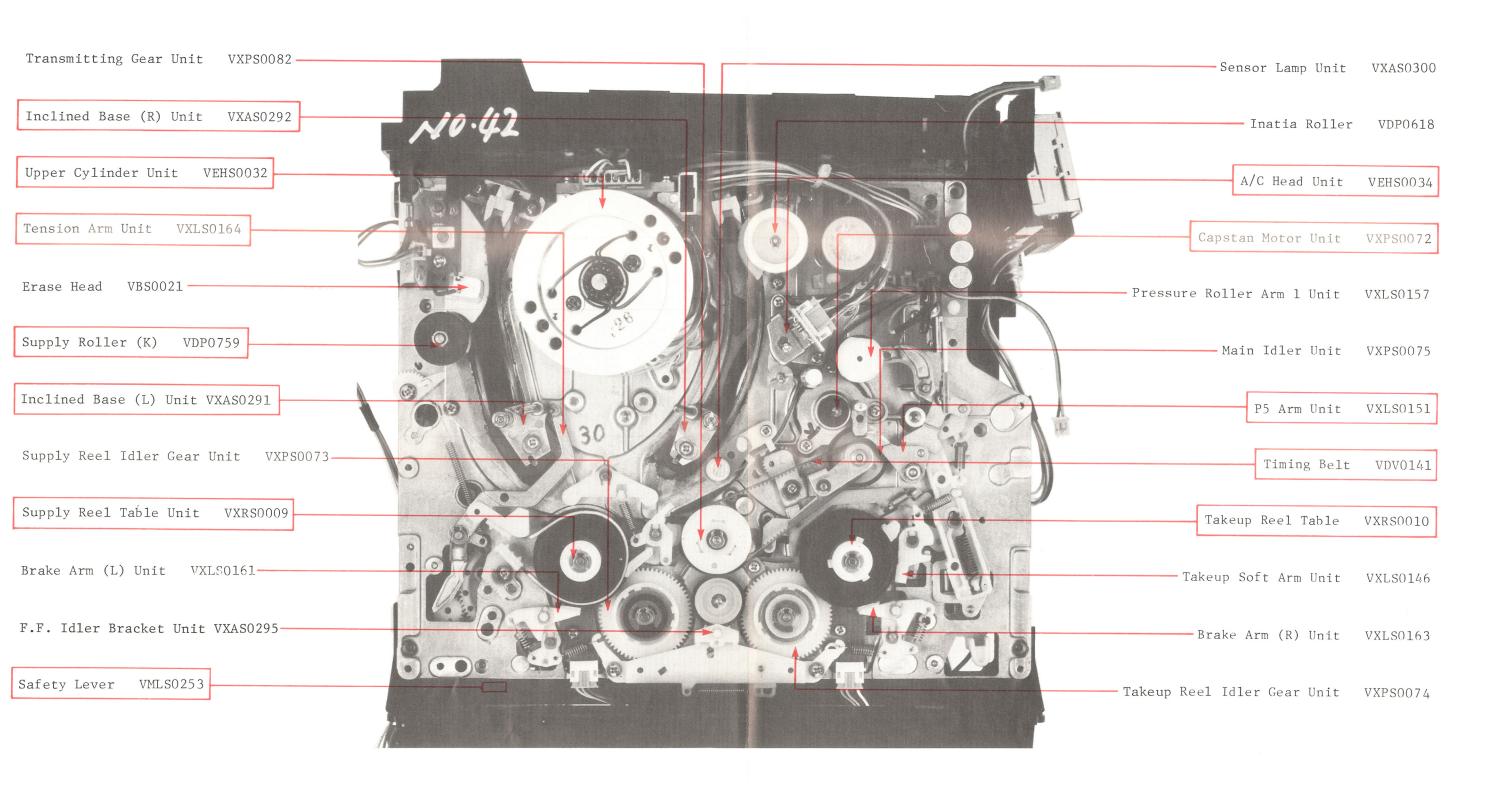
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#### **INNER PARTS LOCATION**

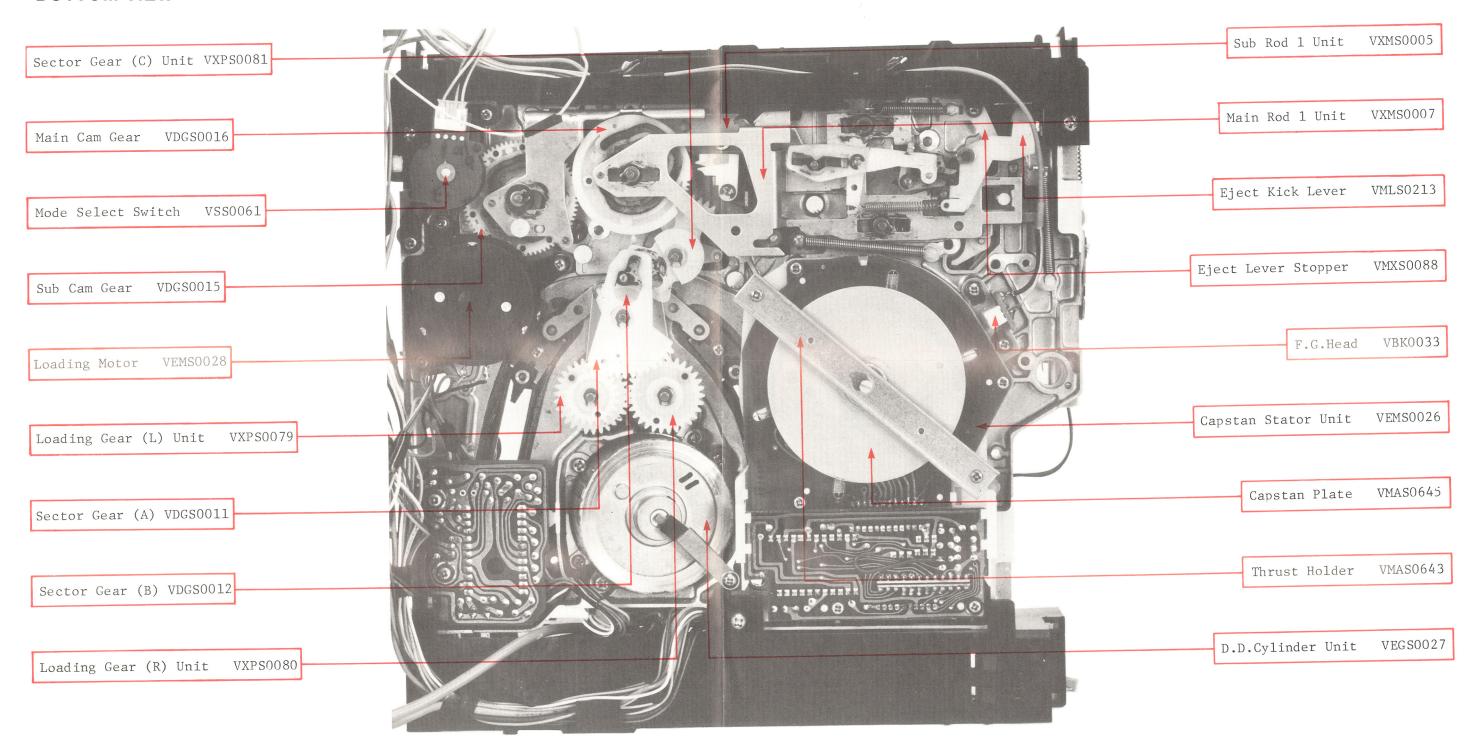
#### **TOP VIEW**

#### Note:

When the mechanical parts surrounded with rectangle were removed or replaced, be sure to perform necessary adjustment or confirmation procedures according to the mechanical adjustment procedures section.



#### **BOTTOM VIEW**

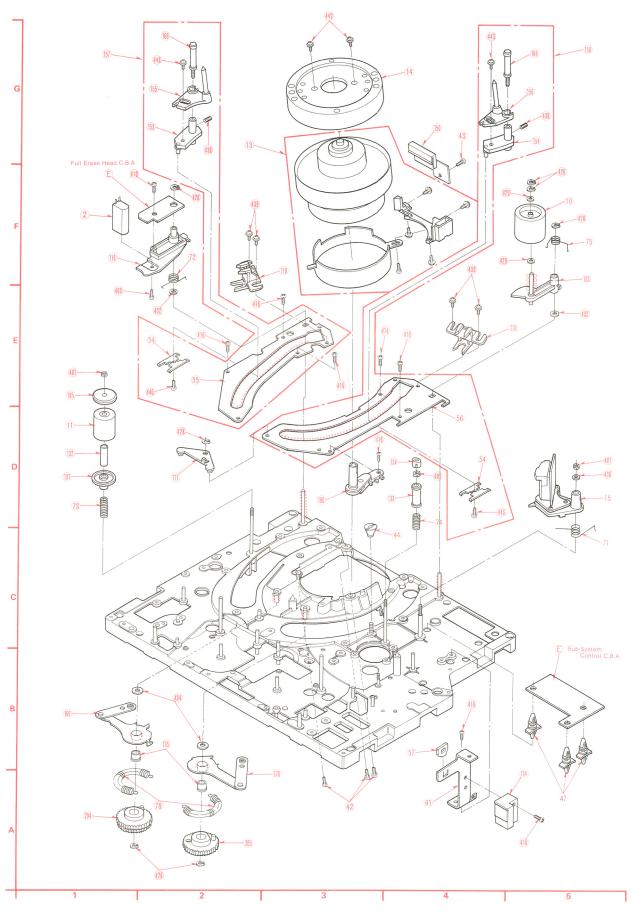


#### LUBRICATION POINTS

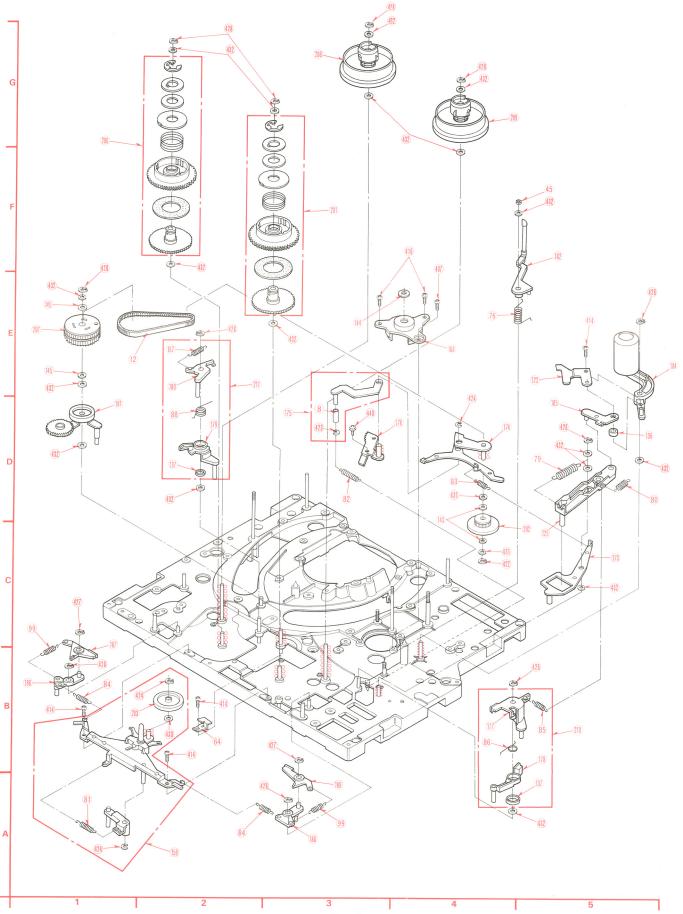
When the marked parts are replaced, apply the recommended lubricants or adhesive for better maintenance of the unit.

Marks	Kind of Lubricant	Availability	Part Number
×××	Morlytone Grease	Available From Factory	MOR265
000	Spindle Oil	Purchase From Local Supplier	
	Gummed Adhesive	Purchase From Local Supplier	

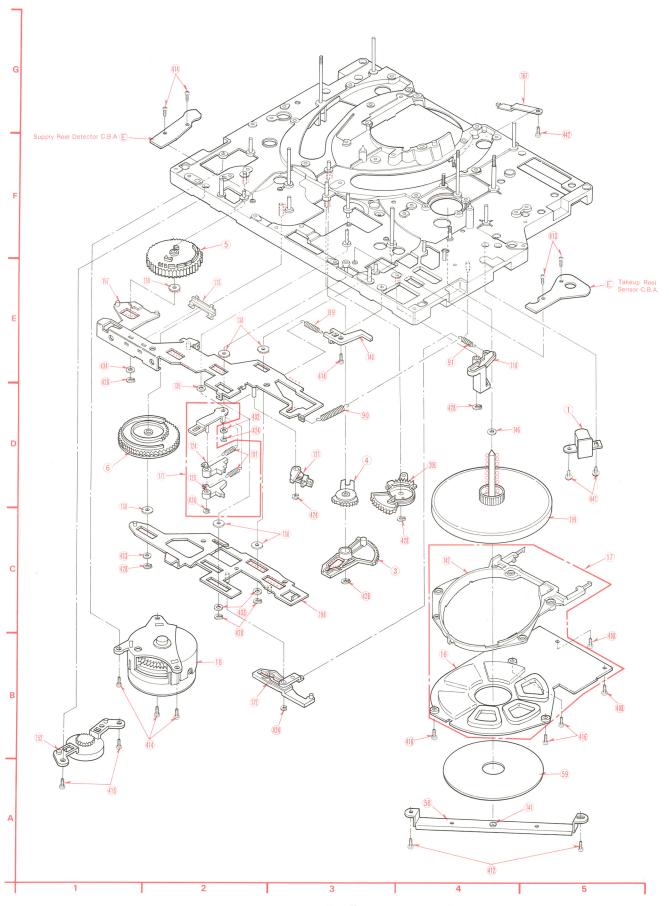
# **EXPLODED VIEW 1** Transport Section



# 2 Moving Mechanism-(1)

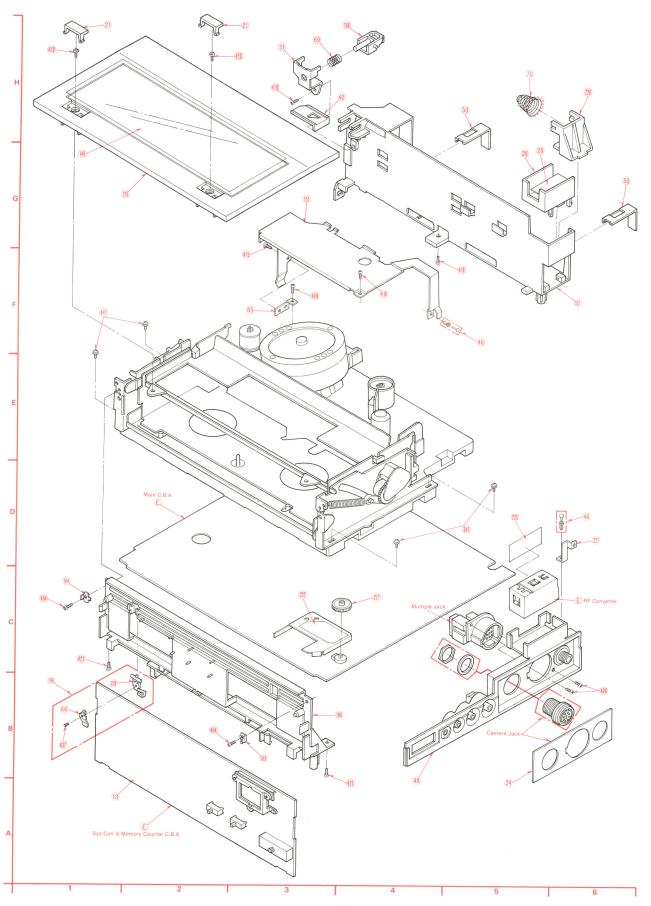


# **1** Moving Mechanism-(2)

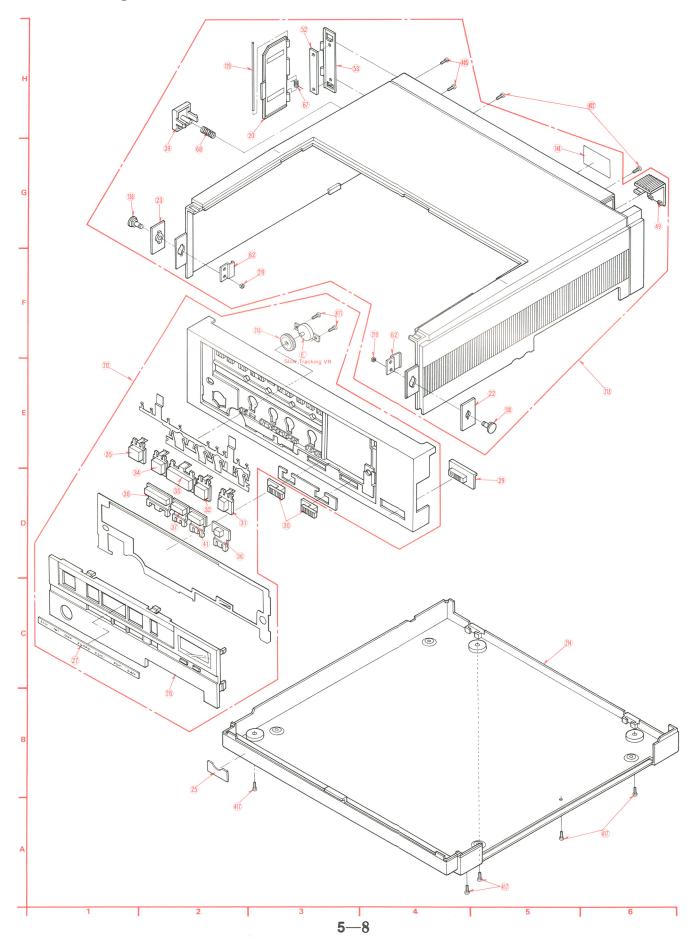


# 4 Chassis Frame Section-(1) 5-6

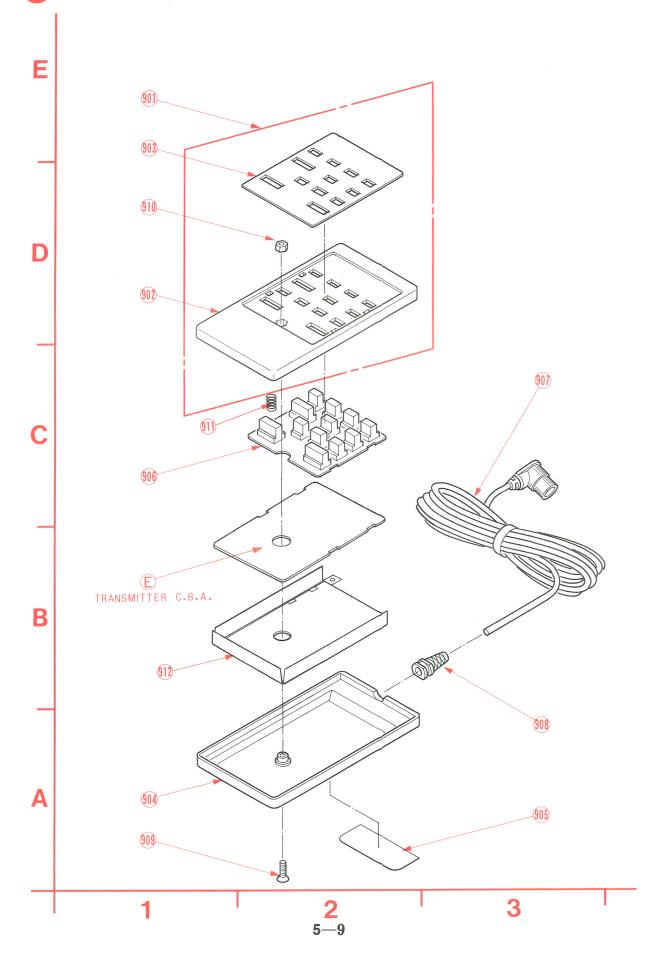
#### 6 Chassis Frame Section-(2)



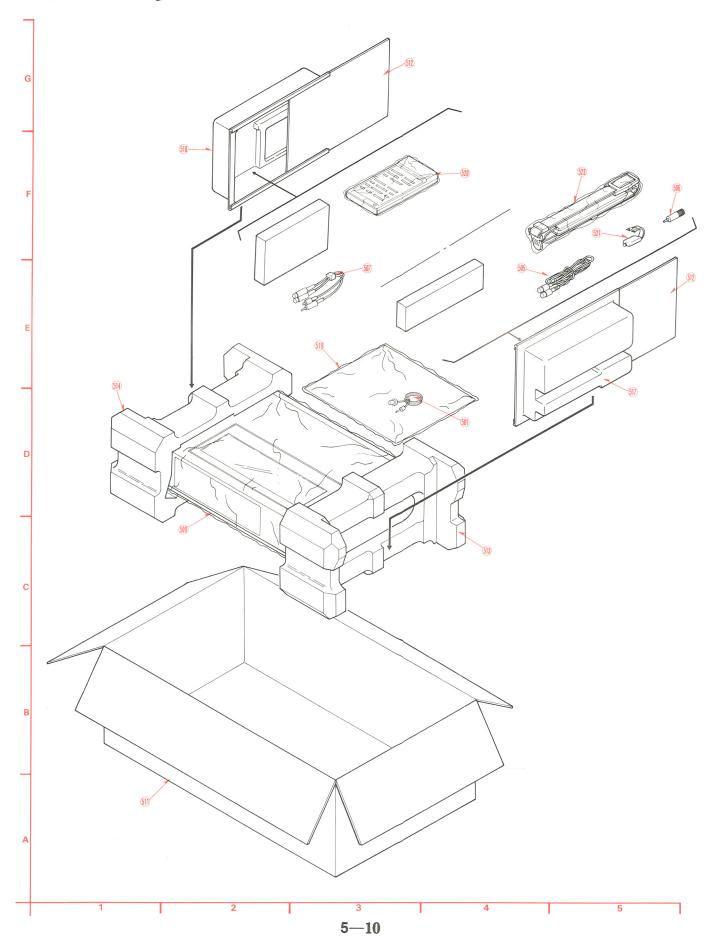
# 6 Casing Parts Section



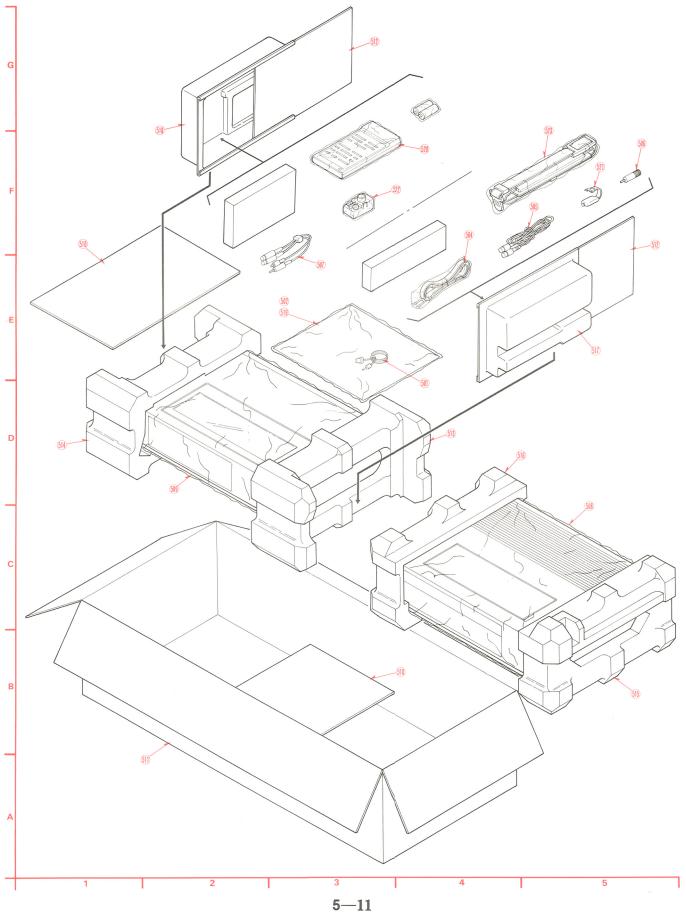
#### 7 Wired Remote Control Section



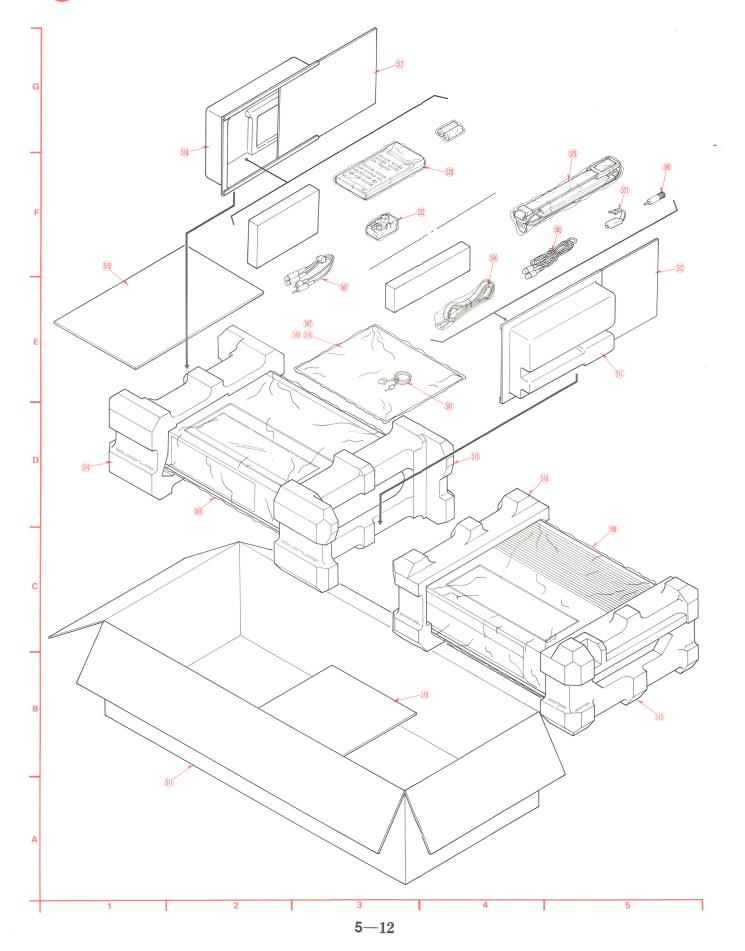
# 8 Packing Parts & Accessories Section (PV-5000)



# Packing Parts & Accessories Section (PV-5200)



#### 10 Packing Parts & Accessories Section (PV-5500)



#### MECHANICAL REPLACEMENT PARTS LIST Model No. PV-5000/5200/5500



	No. PV-5000	CAL REPLACEMEN 0/5200/5500	41 F	ARI	POTIOL		No.	Drawing No.	Description SHAFT HOLDER PLATE	Pcs/ Set	Availa- bility	Part No.	Remark
Note:	*Be sure to ma	ake your orders of replacement parts according	rding to	this list.		NA A	54			2		VMAS0625	
	Since all parts	are available, availability colum indicates	no mar	k			55	1	LOADING GUIDE (L)	1		VMASO626	
						<u> </u>	56	1	LOADING GUIDE (R)	1		VMAS0627	
ltem	Drawing No.	Description	Pcs/ Set	Availa- bility	Part No.	Remark	57	1	CASSETTE OPENER COVER	1		VMAS0627 VMAS0631	
No.	3	F.G HEAD	1	unity	VBK0033		58	3	THRUST HOLDER	1		VMAS0631 VMAS0643	
2	1	ERASE HEAD	1		VBS0021		59	3	CAPSTAN PLATE	1	-	VMAS0645	-
3	3	<del> </del>	1	1	VDGS0021		60	4	CASSETTE HOLDER (B)	1	-	VMAS0653	
- <del>- 4</del>	3	SECTOR GEAR (A)	1				╂┈		GROODITE ROBBIN (B)		ļ	VIIASOUSS	
5	3	SECTOR GEAR (B) SUB CAM GEAR	1		VDGS0012 VDGS0015		61	1	CASSETTE OPENER	1		VMAS0654	
		SUB CAM GEAR	1		VDGS0015		62	6	HANDLE SUPPORT PLATE	2		VMAS0667	
					VDGS0016		63	6	TOP CASE SUPPORT ANGLE	1		VMAS0673	<del></del>
- 6	3	MAIN CAM GEAR	1			1	64	2	BELT GUIDE	1			
7	4	DUMPER UNIT	1	-	VDG0098	-	65	5	SHIELD ANGLE	1		VMAS0676 VMA5904	
8	2	IDLER ROLLER	1		VDPS0052	-	₩"		SHIELD ANGLE	1		VMA3904	
9	4	LOCK ROLLER	2		VDPS0057	<del></del>	66	5	ADJUST ANGLE	1		VMA5914	-
10	1	INERTIA ROLLER	1		VDP0618	-	67	6	BATTERY DOOR SPRING	2		VMBS0140	<del></del>
						ļ	68	6	BATTERY BUTTON SPRING		<del></del>		+
11	1	SUPPLY ROLLER (K)	1		VDP0759		69	5		1	-	VMBS0141	+
12	2	TIMING BELT	1		VDV0141		70	5	STOPPER SPRING BATTERY PUSH SPRING	1		VMBS0142	<del></del>
13	1	D.D CYLINDER UNIT	1	++	VEGS0027	<del> </del>	1-10	J	DATTER: FUSH SPRING	1	<del> </del>	VMBS0143	+
14	1	UPPER CYLINDER UNIT	1	1	VEHS0032		71	1	A/C HEAD CRRING	1		MARCO144	<del> </del>
15	1	A/C HEAD UNIT	ı	<del>  </del>	VEHS0034	<del>-</del>	72	1	A/C HEAD SPRING ERASE HEAD LEVER SPRING	1	-	VMBS0146	-
		<u> </u>				1	73	1	- · · · · · · · · · · · · · · · · · · ·	1	!	VMBS0148	
16	3	CAPSTAN STATOR COIL ASS'Y	1	<del>  </del>	VEMS0025	+	74	1	SUPPLY INERTIA SPRING POST SPRING	1	1	VMBS0149	+
17	3	CAPSTAN STATOR UNIT	1		VEMS0026		75	1		1		VMBS0150	
18	3	LOADING MOTOR	1		VEMS0028		₩-'3-	1	INERTIA ROLLER ARM SPRING	I	-	VMBS0151	-
19	4	CASSETTE UP PROTECTOR	1		VGFS0024		76	2	ADV CORPANS	,			
20	6	BATTERY DOOR	1		VGKS0422		77	4	ARM SPRING	1		VMBS0152	
							78	1	TENSION ARM SPRING	1		VMBS0153	+
21	5	CASSETTE SCREW RUBBER	2		VGKS0426		79	2	LOADING SPRING SPRING	2		VMBS0154	+
22	6	HANDLE DECORATION (R)	1	-	VGKS0427		80	2	<del> </del>	1		VMBS0155	+
23	6	HANDLE DECORATION (L)	1	+	VGKS0430	+	1-00		PRESSURE ROLLER RETURN	1		VMBS0156	+
24	5	JACK PLATE DECORATION	1	1	*VGNS0406	-			SPRING				+
25	6	SLOW TRACKING DECORATION	1		VGNSO421	+	H-0,1	2	T. F. LEWED GERANG				+
26	5	CONVERTER SELECT DECORATION	1	1	VGNS0423	<u> </u>	81 82	2	F.F LEVER SPRING SUB LEVER SPRING	1	1	VMBS0157 VMBS0159	+
27	6	FRONT BUTTON DECORATION	1	1	VGNS0451	+	83	2	MAIN IDLER SPRING	1		VMBS0160	+
28	5	CONVERTER CHANNEL SELECT	1		VGQS0166	<del> </del>	84	2	BRAKE LEVER SPRING	2		VMBS0161	
	-	CASE				+	85	2	TAKEUP SOFT ARM SPRING	ī .	-	VMBS0162	+
29	6	POWER SWITCH KNOB	1	+	VGTS0059		1						+
30	6	CAMERA & SPEED SELECT SW	2	1	VGTS0076		86	2	TAKEUP SOFT BRAKE SPRING	1		VMBS0163	
		KNOB					87	2	SUPPLY SOFT GUIDE SPRING	1		VMBS0164	
						<del></del>	88	2	SUPPLY SOFT BRAKE SPRING	1		VMBS0165	+
31	6	OPERATION BUTTON (RECORD)	1		VGUS0135		89	3	SUB ROD RETURN SPRING	1		VMBS0166	
32	6	OPERATION BUTTON (F.F)	1	†	VGDS0136	-	90	3	SUB ROD SPRING	1	-	VMBS0167	<del>                                     </del>
33	6	OPERATION BUTTON (PLAY)	1	1 1	VGUS0137		<del> </del>						+
34	6	OPERATION BUTTON (REWIND)	1		VGUS0138		91	3	EJECT LEVER RETURN SPRING	1	<u> </u>	VMBS0168	1
35	6	OPERATION BUTTON (EJECT)	1		VGUS0139		92	4	RELEASE ACTION SPRING	1		VMBS0169	<del>-</del>
		, , , , , , , , , , , , , , , , , , , ,			-		93	4	CASSETTE HOLDER SPRING	1	<u> </u>	VMBS0170	1
36	6	OPERATION BUTTON (AUDIO)	1	$\vdash$	VGUS0140	!	94	4	LOCK ARM SPRING	2		VMBS0171	
37	6	OPERATION BUTTON (PAUSE)	1		VGUS0141	-	95	4	LOCK RELEASE SPRING	2		VMBS0172	<del> </del>
38	6	OPERATION BUTTON (STOP)	1		VGUS0142		1						1
39	6	BATTERY EJECT BUTTON	1		VGUS0144		96	4	CASSETTE HOLDING SPRING (R)	1		VMBS0173	
40	5	STOPPER RELEASE BUTTON	1		VGUS0145		97	4	CASSETTE HOLDING SPRING (L)	1		VMBS0174	
						!	98	4	DISCRIMINATING LEVER SPRING	1		VMBS0175	Ť
41	6	OPERATION BUTTON (SLOW)	1		VGUS0146		99	2	BRAKE ARM SPRING	2		VMBS0180	
42	I	SCREW	3		VHDS0016	1	100	4	SUB CASSETTE HOLDING SPRING	1		VMBS0181	T
43	1	SCREW	1		VHD0075	!	1						
44	1	ADJUST NUT	1		VHNS0014		101	3	LATCHET SPRING	2		VMBS0183	1
45	2	SCREW	1		VHNSO015	i	102	4	CASSETTE UP SW SPRING-	1		VMBS0184	T
							103	5	GROUNDING SPRING A (RIGHT	1		VXBS0011	T
46	5	PLASTIC RIVET	2		VHN0011				UNIT)	***			
47	1	HINGE	3		VJF0109		104	5	GROUNDING SPRING A (LEFT	1		VXBS0012	
48	5	JACK PLATE	1		VJJS0029	1	1		UNIT)				
49	6	CONVERTER COVER (A)	1		VKFS0084		105	1	INERTIA ROLLER UPPER	1		VMDS0063	
50	5	REAR FRAME SUPPORT ANGLE	2		VMAS0595		1		LIMITER				
						<b>†</b>							
51	5	STOPPER COVER	1		VMAS0596		106	5	FRONT FRAME	1		VMDS0070	
52	6_	BATTERY DOOR HOLDER	í		VMAS0597		107	5	REAR FRAME	1		VMDS0071	
53	6	BATTERY DOOR HINGE	1		VMAS0598	-	108	5	BATTERY STOPPER	1		VMDS0073	

Item No.	Drawing No.	Description	Pcs/ Set	Availa- bility	Part No.	Remark	Item No.	Drawing No.	Description	Pcs/ Set	Availa- bility	Part No.	Remark
109	4	ADJUST HOOK	1		VMDS0086		166	1	ROLLER POST UNIT	2		VXA0743	
110	1	POST STOPPER	2		VMDS0089		167	3	GROUNDING PLATE	1		VXBS0009	-
-1,1							168	2	HOUSING	1		VXDS0010	
111	1	LOADING GUIDE SUPPORT	1		VMDS0092		169	1	LOADING ARM L UNIT	1		VXLS0134	1
112	4	TRANSISTOR HOLDER	2		VMDS0097		170	1	LOADING GEAR R UNIT	1		VXLS0135	-
113	3	GUIDE BLOCK	1		VMDS0102								
114	1	DEW DETECTOR BLOCK	1	L	VMDS0112		171	3	RELEASE LINK UNIT	1		VXLS0138	
115							172	3	ARM KICK LEVER UNIT	1		VXLS0139	
116	<del></del>	1					173	2	IDLER LEVER UNIT	1	1	VXLS0141	
116	1	ERASE HEAD LEVER	1		VMLS0195		174	2	MAIN IDLER LEVER 1 UNIT	1	1	VXLS0142	<u> </u>
117	4	CASSETTE HOLDING SPRING	I		VMLS0210		175	2	SUB IDLER LEVER UNIT	i		VXLS0143	1
118	3	EJECT KICK LEVER	1		VMLS0213		1					77.00	
119	4	CASSETTE DOWN SW LEVER	1		VMLS0217		176	2	IDLER SUPPORT UNIT	1		VXLS0144	•
120	4	CASSETTE UP SW LEVER	1		VMLS0218		177	2	TAKEUP SOFT ARM UNIT	ì		VXLS0146	
						i.	178	2	TAKEUP SOFT GUIDE UNIT	1		VXLS0147	
121	3	MAIN BRAKE KICK LEVER	1		VMLS0219		179	2	SUPPLY SOFT ARM UNIT	1		VXLS0148	
122	2	KICK LEVER	1		VMLS0223		180	2	SUPPLY SOFT GUIDE UNIT	1	•	VXLS0149	+4)
123	3	LATCHET (A)	1		VMLS0232						-		
124	3	LATCHET (B)	1		VMLS0233		181	2	TRANSMITTING ARM UNIT	1	Ì	VXLS0150	
125	2	TOGGLE ARM	1		VMLS0235	1	182	2	P5 ARM UNIT	1		VXLS0151	
							183	1	INERTIA ROLLER ARM 1 UNIT	I		VXLS0151	
126	4	RELEASE ACTION LEVER	1		VMLS0238		184	2	PRESSURE ROLLER ARM 1 UNIT	<u> </u>	1	VXLS0157	
127	4	DISCRIMINATING LEVER	1		VMLS0239	<del></del>	185	2	CONNECTING ARM UNIT	1	$\vdash$	VXLS0157	T
128	5	SAFETY LEVER	1		VMLS0253							VAII-001-00	<del></del>
129	6	BATTERY DOOR SHAFT	1		VMSS0162		186	2	BRAKE LEVER L UNIT	1		VXLS0160	
130	6	HANDLE SUPPORT	2		VMSS0166		187	2	BRAKE ARM L UNIT	1			
-	-		<del>  -</del>				188	2	BRAKE LEVER R UNIT	1	-	VXLS0161	•
131	1	INERTIA ROLLER LOWER	<del> </del>		VMSS0181	i	189	2				VXLS0162	İ
		LIMITER	+		VN330101	-	190	4	BRAKE ARM R UNIT	1		VXLS0163	
132	1	COLLAR	1		IMVC0025		190	4	TENSION ARM UNIT	1		VXLS0164	
133	1	POST SLEEVE		<u> </u>	VMXS0035		101				<del>-</del>		<u> </u>
134	1	POST CAP	1		VMXS0075		191	4	TENSION BAND UNIT	_1		VXLS0165	
135	1	LOADING ARM SLEEVE	+		VMXS0076		192	4	LOCK RELEASE ARM R UNIT	1	-	VXLS0167	
		LOADING ARM SLEEVE	2	-	VMXS0077		193	4	LOCK RELEASE ARM L UNIT	1		VXLS0168	!
136	2	SLEEVE					194	4	LOCK ARM R UNIT	1		VXLS0169	ļ
137	2	SOFT BRAKE STOPPER	2	<del></del>	VMXS0080 VMXS0084		195 196	<u>4</u>	LOCK ARM L UNIT SAFETY LEVER UNIT	1		VXLS0170 VXLS0191	1
138	3	SLIDE WASHER (A)	5		VMXS0086		197	3	SUB ROD 1 UNIT				
139	3	SLIDE WASHER (B)	$+\frac{1}{2}$		VMXS0087		198	3	MAIN ROD I UNIT	1		VXMS0005	
140	3	EJECT LEVER STOPPER	1		VMXS0088		199	3	CAPSTAN MOTOR UNIT	1		VXMS0007	·
+			1		VIIASOOOC		200	2		1		VXPS0072	Ĺ
141	3	THRUST SCREW	1		VMXS0092	-	200		SUPPLY REEL IDLER GEAR UNIT	1		VXPS0073	i .
142	3	STARTER BRACKET	1		VMXS0093		201	2	TAKEUP REEL IDLER GEAR UNIT				
143	2	IDLER WASHER	2		VMXS0093		202	2	MAIN IDLER UNIT	1		VXPS0074	
144	2	CAPSTAN THRUST WASHER	1	-			203			1		VXPS0075	
145	2	WASHER	2		VMXS0097			2	F.F IDLER UNIT	1		VXPS0076	·
		Mistisk		-	VMXS0098		204	1	LOADING GEAR L UNIT	1		VXPS0079	
146	3	CAPSTAN THRUST WASHER	1		IDMIOACE.		205	1	LOADING GEAR R UNIT	1		VXPS0080	
147	6	WASHER			VMX0265		201						
148	6	TOP COVER CAUTION LABEL	1		VMZS0067 VQLS0188		206	3	SECTOR GEAR C UNIT	1		VXPS0081	
149	5	STICKER					i		TRANSMITTING GEAR UNIT	1		VXPS0082	
150	1	SHIELD CASE	1		VQLS0474		208	2	SUPPLY REEL TABLE UNIT	1		VXRS0009	
	-	OUTTIED ONOE	1		VSCS0145		209	2	TAKEUP REEL TABLE UNIT	1		VXRS0010	_
151	5	CHIELD CACE (MOR)	+		:		210	2	TAKEUP SOFT BRAKE UNIT	1		VXZS0024	
152		SHIELD CASE (TOP)	1-		VSC0737								
153		MODE SELECT SWITCH	1	- 1	VSS0061		211	2	SUPPLY SOFT BRAKE UNIT	1		VXZS0025	
154	1	SHAFT HOLDER L UNIT	1		VXAS0289		212	6	FRONT PANEL UNIT	1		VYPS1087	
		SHAFT HOLDER R UNIT	1		VXAS0290		213	. 6	TOP CASE UNIT	1		VYPS1091	
155	1	INCLINED BASE L UNIT	1		VXASO29I		214	- 6	BOTTOM CASE UNIT	1		VYPS1098	
157			4				215	6	FRONT PANEL 1 UNIT	1		VYPS1112	
156	1	INCLINED BASE R UNIT	1		VXAS0292								
157		LOADING GUIDE L UNIT	1		VXAS0293		216	5	CASSETTE COVER UNIT	1	-	VYPS1176	
158		LOADING GUIDE R UNIT	1		VXAS0294		217	6	TRACKING V.R KNOB	1	i	VGTS0060	
159		F.F IDLER BRACKET UNIT	1		VXAS0295		218	6	SLOW TRACKING V.R KNOB	I		VGTS0061	_
160	_1	SENSOR LAMP UNIT	1		VXAS0300		219	6	M4 NUT	2		VHD0044	
							220	5	BATTERY CATCHER	1	-	VJF0106	
161	4	CASSETTE UP UNIT	1		VXAS0304								<u> </u>
162	4	CASSETTE STAND R UNIT	1		VXASO307		221	5	SHIELD ANGLE (RIGHT)	1		VMAS0678	
163		CASSETTE STAND L UNIT	1		VXAS0308		222	5	FUSE CAUTION LABEL	1	-	VQLS0573	
164		CASSETTE DOWN SW LEVER	1		VXAS0311		223	5	FUSE CAUTION LABEL				
1		PLATE UNIT					-3.5		ONGITON DADEL	1	+	VQLS0574	

Item No.	Drawing No.	Description	Pcs/ Set	Availa- bility	Part No.	Remark	Item No.	Drawing No.	Description	Pcs/ Set	Availa- bility	Part No.	Remark
401	1	M3 NUT	3		XNG3B		901	7	TOP CASE UNIT	1		MU16VCS9P	
402	6	BIND SCREW, 3x6	2		XSB3+6KS		902	7	TOP CASE	1		MU16CS10P	
403	1	SCREW, 2x3	1		XSN2+3		903	7	TOP CASE DECORATION	1		MU16PP14P	
404	5	SCREW, 2.6x6	2		XSN26+6F		904	7	BOTTOM CASE	1		MU16CS11P	
405	6	SCREW, 2x5	2		XSS2+5FK		905	7	PART NO PLATE	1		MU16LB12P	
							1						
406	5	SCREW, 2.6x8	2		XSS26+8		906	7	RUBBER PLATE FOR CONTACT	1	<u> </u>	MU16CT13A	<del> </del>
407	2	TAPPING SCREW, 2.6x6	1		XTN26+6F		1		***************************************	+			<del> </del>
408	3	TAPPING SCREW, 2.6x8	2		XTN26+8F		907	7	REMOTE CONTROL CABLE	1		MU16VPG4	-
							908	7	BUSHING	1		MU16BS16	
409	5	TAPPING SCREW, 3x12	1		XTN3+12F		909	7	SCREW, 2.6x10	1	<u> </u>	XSS26+10FC	
410	1	TAPPING SCREW, 3x8	1		XTN3+8J		910	7	M2.6 NUT	1		URC180NT20	
411	6	TAPPING SCREW, 2x6	2		XTS2+6B		911	7	GROUNDING SPRING	1		MU16BN31	
412	3	TAPPING SCREW, 2.6x12	2		XTV26+12F		912	7	SHIELD SHEET	1	<b></b>	MU16SF32	
413	3	TAPPING SCREW, 2.6x4	2		XTV26+4F		1	•					
414	1,2,3	TAPPING SCREW, 2.6x6	11		XTV26+6F		1⊢					<del> </del>	
415	5	TAPPING SCREW, 2.6x8	2		XTV26+8J		1			÷		<u> </u>	_
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414	1 2 2 5	TARRING CORPU 2 (VO	17		VTV26 10F		<b>∤</b>						
416	1,2,3,5	TAPPING SCREW, 2.6X8	17	1	XTV26+8F		<b>∤</b> ∟						
417	6	TAPPING SCREW, 3x12	5	ļ	XTV3+12AK		1						
418	5	TAPPING SCREW, 3x12	1		XTV3+12F		1						
419	5	TAPPING SCREW, 3x6	4		XTV3+6B		]		1	1			-
420	5	TAPPING SCREW, 3x8	2		XTV3+8		1						+
							11			<del> </del>	<del> </del>	ł	
421	5	TAPPING SCREW, 3x8	2		XTV3+8F		11			1			-
422	2	RETAINING RING E-TYPE, 1.5		<del> </del>			<del>†</del>  ——						
			1		XUC15FP		-						
423	2,4	RETAINING RING E-TYPE, 2.5	3		XUC25FP								
424	2,3	RETAINING RING E-TYPE, 2	7		XUC2FP								
425	4	RETAINING RING E-TYPE, 3	10		XUC3FP								
							lt						
426	1	RETAINING RING C-TYPE, 2	2		XUEV2FP	-	1						
427	2	RETAINING RING C-TYPE, 3	2		XUEV3FP		1		<u> </u>	-			
428	1,2,3,4	RETAINING RING C-TYPE, 3	30		XUEV3VW		1			-			-
429	1		2	-			1			i	ļ		
		POLY SLIDER WASHER, 2			XWGV2D4G		1						
430	2	POLY SLIDER WASHER, 2.5	1_1_	<del> </del>	XWGV25D5G				FIREWOVE	+ .			
431	2	POLY SLIDER WASHER, 2.5	2		XWGV25Y4G		501	. 8	EARPHONE	1		VBESO002	_
432	1,2,3,4		22	-	XWGV3D54G		502			-	1		
		POLY SLIDER WASHER, 3		ļ			503				ļ		
433	3	POLY SLIDER WASHER, 3	3	ļ	XWGV3D7G		504				ļ		
434	1,3	POLY SLIDER WASHER, 3	4		XWGV3D9G		505	8	F-F CABLE	1		VJA0147	1
435	4	POLY SLIDER WASHER, 4	2		XWGV45Y9G								
							506	8	MIC ADAPTOR	1		VJPS0003	
436	1	WASHER, 4	1		XWG4FX		507	8	MIC ATTENUATOR	1		VJP1164	
437	5	HEX. SCREW	1		XXEVO001		508						<del> </del>
438	1	HEX. SCREW	2	!	XXE2C25FP		509	8	DOLUMNING PAR DEC (DECK)	+-,-		VPFS0022	<del></del>
439	1	SCREW WITH WASHER, 2.6x10	4	<del> </del>	XYE26+BF10		11		POLYETHYLENE BAG (DECK)	1	<del> </del>	V1F3UU22	-
440	2	SCREW WITH WASHER, 2.6x5	1		XYE26+BF5		510			+	-	-	+
740		DOREW WITH WASHER, 2.0X3	<u> </u>	-	VITTOLDED		<b>∤</b>			1	-		
			<u></u>	ļ	mino ( : ±:-:		511	8	PACKING CASE	1		VPGS0484	-
441	3,5	SCREW WITH WASHER, 2.6x8	. 6		XYE26+BF8		512	8	ACCESSORY CASE PAD	2	ļ	VPGS0485	
442	3	SCREW WITH WASHER, 3x6	1	<u> </u>	XYNV3+K6		513	8	RIGHT CUSHION (DECK)	1		VPNS0074	
443	1	SCREW WITH WASHER, 2.6x5	2		XYN26+A5		514	8	LEFT CUSHION (DECK)	1		VPNSOO75	
444	4	SCREW WITH WASHER, 2.6x10	2		XYN26+C10FNS		515						
445	4	SCREW WITH WASHER, 2.6x14	1		XYN26+C14		1						
							516				t		
446	1	SCREW WITH WASHER, 2.6x5	2		XYN26+C5				ACCECCODY COOR (1)	+ -		***********	
447	4	SCREW WITH WASHER, 2.6x6	5	-	XYN26+C6	-	517	8	ACCESSORY CASE (A)	1_1_	+	VPNS0080	+
				-		<del></del>	518	8	ACCESSORY CASE (B)	1		VPNS0081	-
448	4	SCREW WITH WASHER, 2.6x8	2	ļ	XYN26+F8		519	8	FAN BAG	1	-	VQFS0280	<del> </del>
449	11	SCREW WITH WASHER, 3x8	2	ļ	XYN3+B8BNS		520	8	WIRED REMOTE CONTROL BOX	1		VSQS0113	
450	4	SCREW WITH WASHER, 3x8	2		XYN3+F8S		1				ļ		
							521	8	VHF MATCHING BOX	1		VSQ0055	
							522						
							523	. 8	SHOULDER BAND	1	1	VYCS0133	T
							1		GROCEPER DAND	1	<b></b>	V1050133	T
			<del> </del> -	+			1	-		-	+		+
			<del> </del>	<del> </del>			<b>I</b> ├						<del></del>
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No.	Drawing No.	Description	Pes/ Set	Availa- bility	Part No.	Remark
501	9	EARPHONE	1	ļ	VBES0002	
502	9	UHF CHANNEL FILM	1		VGKS0452	-
503			+			
504	9	TWIN LEAD CONNECTOR	1		VJA0102	
505	9	F-F CABLE	1		VJA0147	
506	9	MIC ADAPTOR	1		VJPS0003	
507	9	MIC ATTENUATOR	1		VJP1164	
508	9	POLYETHYLENE BAG (TUNER)	1		VPFS0012	
509 510	9	POLYETHYLENE BAG (DECK)	1		VPFS0022	
310	9	PAD	I		VPGS0480	<u> </u>
511	9	PACKING CASE	1		VPGS0482	
512	9	ACCESSORY CASE PAD	2		VPGS0485	
513	9	RIGHT CUSHION (DECK)	1		VPNS0074	
514	9	LEFT CUSHION (DECK)	1		VPNS0075	
515	9	RIGHT CUSHION (TUNER)	1		VPNS0076	
516	9	LEFT CUSHION (TUNER)	1		VPNS0077	-
517	9	ACCESSORY CASE (A)	1		VPNS0077	+
518	9	ACCESSORY CASE (B)	1		VPNS0081	<del> </del>
519	9	FAN BAG	1		VQFS0279	
520	9	WIRED REMOTE CONTROL BOX	1		VSQS0113	
521						
521 522	9	VHF MATCHING BOX	1		VSQ0055	
523	9	VHF ANTENNA ADAPTOR SHOULDER BAND	1		VSQ0057	
-	<del></del>	SHOULDER BAND	1		VYCS0133	
			<b>†</b>			
			ļ		<u></u>	
			+			ļ
			+			
501	10	EARPHONE	1		VBES0002	
502	10	UHF CHANNEL FILM	1		VGKS0452	
503	10	CATV CHANNEL FILM	1		VGKS0454	
504	10	TWIN LEAD CONNECTOR	1		VJA0102	
505	10	F-F CABLE	1		VJA0147	
506	10	MIC ADAPTOR	1		VJPS0003	
507	10	MIC ATTENUATOR	1	-	VJP1164	
508	10	POLYETHLENE BAG (TUNER)	1	-+	VPFS0012	
509	10	POLYETHLENE BAG (DECK)	1		VPFS0022	
510	10	PAD	1		VPGS0480	
E11	10		1			
511	10	PACKING CASE	1		VPGS0481	
512	10	ACCESSORY CASE PAD RIGHT CUSHION (DECK)	2		VPGS0485	
514	10	LEFT CUSHION (DECK)	1		VPNS0074 VPNS0075	· · · · · · · · · · · · · · · · · · ·
515	10	RIGHT CUSHION (TUNER)	1		VPNS0075	
516	10	LEFT CUSHION (TUNER)	1		VPNS0077	
517	10	ACCESSORY CASE (A)	l		VPNSO080	
518	10	ACCESSORY CASE (B)	1		VPNS0081	
520	10	FAN BAG	1		VQFS0278	-
		IR WIRELESS TRANSMITTER UNIT	1	+	VSQS0114	
-			1			
$\rightarrow$		I	7			1
21	10	VHF MATCHING BOX	1		VSQ0055	
521	10 10	VHF MATCHING BOX VHF ANTENNA ADAPTOR	1		VSQ0055 VSQ0057	

Item No.	Drawing No.	Description	Pcs/ Set	Availa- bility	Part No.	Remark
		SERVICING FIXTURES & TOOLS				
_		DERVICING FIRTURES & TOOLS				
		ADAPTOR FOR VFK0133			VFK0134	
		CASSETTE HOLDER FIXTURE			VFKS0017	
		DIAL TORQUE GAUGE			VFK0133	
_		FAN-TYPE TENSION GAUGE			VFK66	
		FINE ADJ. SCREWDRIVER			VFK0136	for 3mmφ
	****	H-POSITION ADJ. SCREWDRIVER			VFKS0003	
		HEAD CLEANING STICK			VFK27	
		HEX. WRENCH			VFK0146	for 0.9mm
		HEX. WRENCH			VFK76	for 1.5mm
		LEAF SWITCH ADJ. FIXTURE			VFKS0018	101 1,5
		MORLYTONE GREASE			MODOCE	
		PLASTIC FLAMPER FOR VFK0133			MOR265 VFK0180	
		POST ADJ. PLATE			VFKS0010	<u> </u>
		POST ADJ. SCREWDRIVER		-	VFK0137	
		REEL TABLE HEIGHT GAUGE			VFKS0009	
		DETAINING DING DEMONIO				1
		RETAINING RING REMOVER TENSION POST ADJ. PLATE			VFK0144	for 3mmq
-		V-STOPPER ADJ. FIXTURE			VFKS0015	
		VHS ALIGNMENT TAPE			VFKS0016	
		VIIS ALTGREENT TAPE			VFM8080H6	
_						
				-		-
				- :		
						-
				į		

	-5000/5200/5500	LACEMENT PAR'			Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
Note:	the years and over of nomin	acement parts according to this list.			Q1011	2SB819(Q,R)		1	
IMPORTAN'	r SAFETY NOTICE				Q1012	2SB643(Q,R,S)		l	
	dentified by shade have only the original ones.	e special characteristics important for s	afety. Whe	en replacing any of these com-	Q2001-2003	2SD636(Q,R)		3	
3. Unless otherv	vise specified;	. ra	0		Q2005	2SD636(Q,R)		1	
All resistors a	are in OHMS (11), 1/8w, s are in MICROFARA	$\pm 5\%$ carbon, K=1,000Ω, M=1,000 K DS ( $\mu$ F), $\pm 10\%$ P= $\mu\mu$ F.	u.		Q2006	2SB641(Q,R,S)		1	
All coils are i	n MICROHENRIES ( t Board Assembly.	$_{1}H), m=10^{3}\mu.$			Q2007	2SD636(Q,R)		1	
5. C.B: Circuit I	Board.				Q2011,2012	2SD636(Q,R)		2	
T	T		Рсв		Q2013	2SB641(Q,R,S)		1	
Ref. No.	Part No.	Part Name & Description	Set	Remarks	Q2014	2SD636(Q,R)		1	
	VEPSO317A	MAIN C.B.A.	1		Q2015	2SB641(Q,R,S)	A	1	
	1				Q2016-2021	2SD636(Q,R)	ve-	6	
	VEPS0648A	SYSTEM CONTROL & MEMORY	1		Q2022,2023	2SB641(Q,R,S)		2	
	VEL 300408	COUNTER C.B.A.	-		Q3001	2SB641(Q,R,S)		1	
		COUNTER C.B.A.	-	11.1/1	41	2SC2206(B,C)	hard to	2	
					Q3002,3003				
	VEPS0226A	CAPSTAN MOTOR DRIVE C.B.A.	1		Q3004	2SD636(Q,R)		1	4.0
	ļ		<u> </u>		Q3006,3007	2SC2206(B,C)		2	
	VEPS0227A	CYLINDER MOTOR DRIVE	1		Q3008	2SD636(Q,R)		. 1	
		C.B.A.			Q3009	2SB649(Q,R,S)		1	
					Q4001-4004	2SD636(Q,R)		4	
	VEPS0408A	FULL ERASE HEAD C.B.A.	1		Q6401	2SA886V(Q,R)		1	
					Q6402	2SB793(Q,R,S)		1	
	VEPSO649A	SUB SYSTEM CONTROL C.B.A.	1		Q6403,6404	2SD892(Q,R)		2	
	1				Q6405,6406	2SD636(Q,R)		2	
	VEPS00174	SUPPLY REEL DETECTOR	1		Q6407	2SB774(Q,R,S)		1	
		C.B.A.	1		Q6501,6502	2SD636(Q,R)		2	AMAZA V MARTAN
			-		Q6503,6504	2SB641(Q,R,S)		2	
	VEPS00173	TAKEUP REEL DETECTOR	1		Q6505	2SD647(Q,R,S)		1	
	VEI 300173	C.B.A.			Q6506	2SB641(Q,R,S)		1	
		C.B.A.			Q6507	2SD636(Q,R)		1	
			<b>—</b> ,		1)			2	
	VUPS0006	TAKEUP PHOTO TR C.B.A.	1		Q6508,6509	2SD637(Q,R,S)			
		<del></del>	1 -					+	
	VUPSOOO7	SUPPLY PHOTO TR C.B.A.	1		-	-			
			-		-				
	VEKS0881	SAFETY TAB SWITCH C.B.A.	1						
	MU16VPB3	TRANSMITTER C.B.A.	1				Diodes	<u> </u>	
					D1001-1004	ERA81-004U13	Zener	4	
					D1005,1006	MA165		2	
		MAIN C.B.A.			D2001-2005	MA165		5	
		***************************************			D2010-2014	MA165		5	
					D3001-3006	MA165		6	
		Integrated Circuits	+		D3007	1SS86 or	1,000	1	
C1001	BA6122		1			18899			
C1002	VCRO044		1		D3008	RD3.3EB	Zener	1	
C2001	AN6357		1		D3009	MA165		1	
C2002	MN6165VBA	<del>-</del>	1		D3010,3011	1SS86 or		2	·
02002	AN6356		1		1	15599		1 -	
C2003	MN6280	1.00	1		D6401	RD11JB	Zener	1	
C2004 C2005			1	n day.	D6401 D6402-6405	MA165	Seller	4	
04007	AN6562 or		1		D6402-6403	ERA81-004	Zener	1	
C2006	μPC358C		.  -				vellet	+ +	
C2006	VCR0053		1		D6407-6411	MA165		5	
02007	MN1453VFB		1		D6501-6507	MA165		7	
C2008	AN6914	·	1	AND THE RESERVE OF THE PERSON	D6508	ERA81-004	Zener	1	
23001	VEFSY001		1		D6509	ERC04-02E3	Zener	1	
C3002	VEFSY002		1		D6510,6511	ERZ-C03DK820	Zener	2	
23003	VCR0042		1		D6513	MA165		1	
C3004	AN6326		1		D7512	ERZ-C03DK220	Zener	1	
3005	VCR0043		1						
24001	VEFSA001		1						
24002	VEFSA002		1						
36401	VCR0045		1				Resistors		
28001	VEFSC001		1		R1001	ERDS2TJ153	1/4W 159	1	
08002	VEFSC002		1		R1002	ERDS2TJ393	1/4W 391		
	12133002		+ +		R1002	ERDS2TJ103	1/4W 10H	-+	
		T	+		R1005,1004	ERDS2TJ333	1/4W 10F	-+	
001 1000	-   -	Transistors	+-+						
1001-1003	2SB835		3		R1006	ERDS2TJ331	1/4W 330	+	
1004	2SD992(K,L,M)		1		R1007	ERDS2TJ182	1/4W 1.8I	-	
1005	2SB641(Q,R,S)		1		R1008	ERDS2TJ391	1/4W 390		
1006-1009	2SD636(Q,R)		4		R1009	ERDS2TJ222	1/4W 2.21	cl II	

Ref. No.	Part N	0.	Part Name & Description	Pcs / Set	Remarks	Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
R1011	ERDS2TJ68	1	1/4W 680	-		R2057,2058	ERDS2TJ223	1/4W 22K		
R1012	ERDS2TJ12	2	1/4W 1.2K	1		R2059,2060	ERDS2TJ103	1/4W 10K	-	
R1013	ERDS2TJ1R	0	1/4W 1	1		R2061	EROS2TKG180		-	<del> </del>
R1014	ERX12ANJR	56	1/2W 0.56	1		1		1/4W 18K	1	
R1015	ERDS2TJ33	3	1/4W 33K	1		R2062	EROS2TKG330		+	
R1016	ERDS2TJ10	4	1/4W 100K	1		1	-	1/4W 33K	1	
R1017	ERDS2TJ27	3	1/4W 27K	1		R2063	ERDS2TJ122	1/4W 1.2K		-
R1018	ERDS2TJ18	3	1/4W 18K	1		R2064	ERDS2TJ472	1/4W 4.7K	+	
R1019,1020	ERDS2TJ47	3	1/4W 47K	2		R2065	ERDS2TJ104	1/4W 100K		
R1021	ERDS2TJ47		1/4W 4.7K	1		R2066	ERDS2TJ223	1/4W 100K	+	
R1022	ERDS2TJ12		1/4W 12K	1		R2067	EVN3ACA00B2			
R1023	ERDS2TJ33		1/4W 33K	1		R2068	ERDS2TJ223			
R1024	ERDS2TJ10		1/4W 100K	1		R2069,2070	ERDS2TJ332			
R1025	ERDS2TJ56		1/4W 56K	1	-	R2071	ERDS2TJ105	1/4W 3.3K	+	-
R1026	ERDS2TJ10		1/4W 1K	1		R2071		1/4W 1M	-	
R1027	ERDS2TJ12		1/4W 12K	1		R2072	ERDS2TJ104	1/4W 100K		
R1028	ERDS2TJ12		1/4W 1.2K				ERDS2TJ224	1/4W 220K	+	
R1029,1030	EVN3ACA00			1	<u> </u>	R2074	ERDS2TJ103	1/4W 10K	<del>  -</del>	
R1029,1030	ERDS2TJ10		Variable 50K	2		R2075	ERDS2TJ332	1/4W 3.3K	1	
R2001-2004			1/4W 10K	1		R2076	ERDS2TJ562	1/4W 5.6K	_	
R2001-2004	ERDS2TJ10		1/4W 100K	4		R2077,2078	ERDS2TJ104	1/4W 100K	2	
	ERDS2TJ56		1/4W 56K	1		R2079	EVN3ACA00B2		1	
R2006	ERDS2TJ22		1/4W 220K	1		R2080	ERDS2TJ103	1/4W 10K	1	
R2007	ERDS2TJ10		1/4W 10K	1		R2081	ERDS2TJ563	1/4W 56K	1	
R2008	ERDS2TJ56		1/4W 56K	1		R2082	ERDS2TJ334	1/4W 330K	1	
R2009	ERD25TJ22		1/4W 22K	1		R2083,2084	ERDS2TJ563	1/4W 56K	2	
R2010	ERDS2TJ12		1/4W 1.2K	1		R2085	ERDS2TJ562	1/4W 5.6K	1	
R2012	ERDS2TJ27		1/4W 27K	1		R2086	ERDS2TJ104	1/4W 100K	1	
R2013,2014	ERDS2TJ10	4	1/4W 100K	2		R2087	ERDS2TJ562	1/4W 5.6K	2	
R2015	ERDS2TJ27	2	1/4W 2.7K	1		R2097	ERD25TJ103	1/4W 10K	1	
R2016	ERDS2TJ33	3	1/4W 33K	1		R2098	ERDS2TJ683	1/4W 68K	1	
R2017	ERDS2TJ10	3	1/4W 10K	1		R2099	ERDS2TJ331	1/4W 330	1	
R2018	ERDS2TJ33	2	1/4W 3.3K	1		R2100	ERDS2TJ274	1/4W 270K	1	
R2019	ERDS2TJ10	2	1/4W 1K	1		R2101	ERDS2TJ224	1/4W 220K	1	
R2020,2021	ERDS2TJ10	3	1/4W 10K	2		R2102	ERPF3A4M402			
R2022	ERDS2TJ47		1/4W 47K	1		R3001,3002	ERDS2TJ103	1/4W 10K	2	
R2023	ERDS2TJ12	2	1/4W 1.2K	1		R3003	ERDS2TJ102	1/4W 1K	1	
R2024	ERDS2TJ15	4	1/4W 150K	1		R3004	ERDS2TJ472	1/4W 4.7K	1	
R2025	ERDS2TJ224	4	1/4W 220K	1		R3005	ERDS2TJ562	1/4W 5.6K	1	
R2026	ERDS2TJ15	4	1/4W 150K	1		R3006	ERDS2TJ272	1/4W 2.7K	1	
R2027	ERDS2TJ10	4	1/4W 100K	1		R3007,3008	ERDS2TJ333	1/4W 33K	2	
R2028,2029	ERDS2TJ15	4	1/4W I50K	2		R3009	ERDS2TJ102	1/4W 1K	1	
R2030	ERDS2TJ12	<b>,</b>	1/4W 120K	1		R3011	ERDS2TJ222	1/4W 2.2K	1	
R2031	ERDS2TJ333	3	1/4W 33K	1		R3013	ERDS2TJ102	1/4W 1K	1	
R2032	ERDS2TJ152	2	1/4W 1.5K	1		R3014	ERDS2TJ272	1/4W 2.7K	1	
R2033	EROS2TKG82	202	Precision Metal Film			R3015	ERDS2TJ331	1/4W 330	1	
			1/4W 82K	1		R3016	ERDS2TJ102	1/4W 1K	1	
R2034	EROS2TKG56	502	Precision Metal Film			R3018	ERDS2TJ102	1/4W 1K	1	
			1/4W 56K	1		R3019	ERDS2TJ392	1/4W 3.9K	1	
R2035	ERDS2TJ103	3	1/4W 10K	1		R3020	ERDS2TJ562	1/4W 5.6K	1	
R2036	ERDS2TJ104		1/4W 100K	1		R3021	ERDS2TJ681	1/4W 5.68	1	
R2037	ERDS2TJ105		1/4W 1M	1		R3022	ERDS2TJ271	1/4W 880		
R2038	ERDS2TJ103		1/4W 10K	1		R3023	ERDS2TJ471	1/4W 2/0	1	
R2039	ERDS2TJ563		1/4W 16K	1		R3024	ERDS2TJ124		i	
R2040	ERDS2TJ183		1/4W 18K	1		R3024		1/4W 120K	1	
R2041	ERDS2TJ1223					<del></del>	ERDS2TJ104	1/4W 100K	1	
R2041	ERDS2TJ223			1	a ====	R3026	ERDS2TJ393	1/4W 39K	1	
R2042	ERDS2TJ154		1/4W 150K	1		R3027	ERDS2TJ392	1/4W 3.9K	1	
R2043			1/4W 270K	1		R3028	ERDS2TJ102	1/4W 1K	1	
R2044	ERDS2TJ683	_	1/4W 68K	1		R3029	ERDS2TJ222	1/4W 2.2K	1	
R2045	ERDS2TJ822		1/4W 8.2K	1		R3030	ERDS2TJ100	1/4W 10	1	
R2046	EVN3ACA00E		Variable 100K	1		R3031	ERDS2TJ681	1/4W 680	1	
	ERDS2TJ223	_	1/4W 22K	1		R3034	EVN3ACA00B53		1	
R2048	ERDS2TJ682		1/4W 6.8K	1		R3035	ERDS2TJ681	1/4w 680	1	
R2049	ERDS2TJ123	_	1/4W 12K	1		R3036	ERDS2TJ104	1/4W 100K	1	
R2050	ERDS2TJ274		1/4W 270K	1		R3037	ERD25TJ682	1/4w 6.8K	1	
R2051	ERDS2TJ472	-	1/4W 4.7K	1		R3038	ERDS2TJ222	1/4W 2.2K	1	
R2052	ERDS2TJ222	. ]	1/4W 2.2K	1		R3039	ERDS2TJ100	1/4W 10	1	
R2053	ERDS2TJ181		1/4W 180	1		R3040,3041	EVN3ACA00B13	Variable 1K	2	
R2054	ERDS2TJ473	T	1/4W 47K	1		R3043,3044	ERDS2TJ152	1/4W 1.5K	2	
R2055	ERDS2TJ104		1/4W 100K	1		R3045	ERDS2TJ102	1/4W 1K	1	
				$\rightarrow$				-,		

T			Pes	B 1	Def No.	Dr. N.	Daw Manager	)	Pcs	Para-l-
Ref. No.	Part No.	Part Name & Description	Set	Remarks	Ref. No.	Part No.	Part Name & I		Set	Remarks
R3047,3048	ERDS2TJ102	1/4W 1K	2		R6518	ERDS2TJ682		1/4W 6.8K	1	
R3049	ERDS2TJ561	1/4W 560	1		R6519	ERDS2TJ563		1/4W 56K	1	
R3051	ERDS2TJ182	1/4W 1.8K	1		R6520,6521	ERDS2TJ332		1/4W 3.3K	2	
R3052,3053	ERDS2TJ391	1/4W 390	2		R6522	ERDS2TJ822	v	1/4W 8.2K	1	
R3054	EVN3ACA00B13	Variable 1K	1		R6523	EVJ5LA007B15	Variable Track		1	
R3055	ERDS2TJ820	1/4W 82	_1		R6524	EVN3ACA00B15	Variable	100K	1	
R3056	ERDS2TJ821	1/4W 820	1		R6525	ERDS2TJ103		1/4W 10K	1	
R3057	ERDS2TJ100	1/4W 10	1		R6526,6527	ERX12ANJR22	Metal Oxide	1/2W 0.22	2	
R3058	ERDS2TJ103	1/4W 10K	1		R6528	ERDS2TJ222		1/4W 2.2K	1	
R3059	ERDS2TJ102	1/4W 1K	1		R6529	ERDS2TJ563		1/4W 56K	. 1	
R3060	ERDS2TJ561	1/4W 560	1		R6530	ERDS2TJ223		1/4W 22K	1	***************************************
R3061	ERDS2TJ563	1/4W 56K	1		R6531	ERDS2TJ222		1/4W 2.2K	1	***************************************
R3062	ERDS2TJ104	1/4W 100K	1		R6532	ERDS2TJ270	ļ	1/4W 27	. 1	
R3063	ERDS2TJ152	1/4W 1.5K	1		R8001	ERDS2TJ222		1/4W 2.2K	1	
R3064	ERDS2TJ684	1/4W 680K	1		R8002	ERDS2TJ272		1/4W 2.7K	. 1	+
R3065	ERDS2TJ103	1/4W 10K	1		R8003,8004	ERDS2TJ102	ļ	1/4W 1K	2	
R3066	ERDS2TJ102	1/4W 1K	1		R8006	ERDS2TJ821		1/4W 820	1	
R3070	ERD25TJ151	1/4W 150	1		R8007	ERDS2TJ152	ļ	1/4W 1.5K	1	
R3071	ERD25TJ102	1/4W 1K	1		R8008	ERDS2TJ391		1/4W 390	1	
R4001	ERDS2TJ472	1/4W 4.7K	1		R8009	EVN3ACA00B23	Variable	2K	1	
R4003	ERDS2TJ220	1/4W 22	1		R8010	ERDS2TJ391	<u> </u>	1/4W 390	1	
R4004	ERDS2TJ271	1/4W 270	1		R8011	ERD25TJ471		1/4W 470	1	
R4005	EROS2TKG2502	Precision Metal Film			R8012	ERDS2TJ101		1/4W 100	1	
		1/4W 25K	1		R8013	ERDS2TJ821		1/4W 820	1	
R4006	ERDS2TJ223	1/4W 22K	1	1	R8014	ERDS2TJ122		1/4W 1.2K	_ 1	
R4007	ERDS2TJ151	1/4W 150	1		R8015	ERDS2TJ271		1/4W 270	_1	
R4008	ERDS2TJ471	1/4W 470	1		R8016	EVN3ACA00B52	Variable	500	1	
R4009	ERD25TJ181	1/4W 180	1							
R4010	ERDS2TJ271	1/4W 270	1	-						
R4011	EVN3ACA00B15	Variable 100K	1			:			:	
R4012	ERDS2TJ333	1/4W 33K	1							
R4013	ERDS2TJ472	1/4W 4.7K	1		ļ :	!	:			
R4014	ERDS2TJ103	1/4W 10K	1	1		-				
R4014	ERDS2TJ330	1/4W 33	1				Capacitors			
R4015	ERDS2TJ473	1/4W 47K	1		C1001	ECCZ1H390K	Ceramic	50V 39P	1	
R4018	ERDS2TJ182	1/4W 1.8K	1		C1002	ECKZ1H221KB	Ceramic	50V 220P	1	
R6401	ERDS2TJ102	1/4W 1K	1		C1003	ECKZ1H103ZV	Ceramic	50V 0.01	1	
R6402	ERX12ANJR51	Metal Oxide 1/2W 0.51	1	<u> </u>	C1004	ECKF1H103ZV	Ceramic	50V 0.01	1	
R6403	ERDS2TJ220	1/4W 22	1		C1005	ECKZ1H331KB	Ceramic	50V 330P	1	
R6404	ERDS2TJ823	1/4W 82K	1		C1006,1007	ECEA1CSS221	Electrolytic	16V 220	2	
R6405	ERDS2TJ102	1/4W 1K	1	<u> </u>	C1008	ECEA1CSS101	Electrolytic	16V 100	1	
R6406	ERDS2TJ221	1/4W 220	1		C1009,1010	ECEA1ASS221	Electrolytic	10V 220	2	
R6407	ERDS2TJ473	1/4W 47K	1		C1011,1012	ECEA0JSS221	Electrolytic	6.3V 220	2	
R6408,6409	ERDS2TJ103	1/4W 10K	2		C1013	ECEAOJK330	Electrolytic	6.3V 33	1	
R6410	ERDS2TJ562	1/4W 5.6K	1		C1014	EECEAOJK101	Electrolytic	6.3V 100	1	
R6411	ERDS2TJ563	1/4W 56K	1		C1015	ECEA1HK010	Electrolytic	50V 1	1	
R6412	ERDS2TJ333	1/4W 33K	1		C1016	ECKZ1H103ZV	Ceramic	50V 0.01	1	
R6413,6414	ERDS2TJ563	1/4W 56K	2	<u> </u>	C2001	ECKZ1H102KB	Ceramic	50V 0.001	1	
R6415,6416	ERDS2TJ683	1/4W 68K	2		C2002	ECWM1H272KZ	Polyester	50V 0.0027	1	
R6417	ERDS2TJ103	1/4W 10K		<u> </u>	C2003	ECWM1H102KZ	Polyester	50V 0.001	1	
R6418	ERDS2TJ473	1/4W 47K			C2004	ECEA1EKN2R2	Electrolytic	25V 2.2	1	
R6419	ERDS2TJ333	1/4W 33K	1	<u> </u>	C2005	ECWM1H152KZ	Polyester	50V 0.0015	. 1	
R6420	ERD25TJ333	1/4W 33K	1	ł · · · · · · · · · · · · · · · · · · ·	C2006	ECSF16ER1K	Tantalum	16V 0.1	1 1	
R6501	ERDS2TJ680	1/4W 68	1	1	C2007	ECWM1H222KZ	Polyester	50V 0.0022	d	
R6502	ERDS2TJ104	1/4W 100K			C2007	ECEAOJK470	Electrolytic	6.3V 47		
R6503	ERDS2TJ304	1/4W 100k	<u>l</u>	:	C2008	ECEA1HKN010	Electrolytic	50V 1		
R6504	ERDS2TJ223	1/4W 22K	1	<del> </del>	C2009	ECEA1EKN2R2	Electrolytic	25V 2.2	<del></del>	
R6505		<del></del>	ļ <del></del> .		C2010	ECEA1HK010		50V 1	• • • •	
R6506	ERDS2TJ103		1	1		ECWM1H562KZ	Electrolytic	50V 0.0056	<del> </del>	
R6506	ERDS2TJ224	1/4W 220K	1		C2012,2013		Polyester			
	ERDS2TJ474	1/4W 470K	1	<del> </del>	C2014	ECSF16ER1K	Tantalum	16V 0.1		
R6508	ERDS2TJ222	1/4W 2.2K		į	C2015,2016	ECEAOJK470	Electrolytic	6.3V 47	•	
R6509	ERDS2TJ103	1/4W 10K	1	i	C2017	ECEA1CK100	Electrolytic	16V 10	*	·
R6510	ERDS2TJ683	1/4W 68K	1	<u></u>	C2018	ECEA1HK010	Electrolytic	50V 1		
	ERDS2TJ561	1/4W 560	1		C2019	ECCZ1H080CC	Ceramic	50V 8P	-	
		1 (//11 220	ı		C2020	ECWM1H562KZ	Polyester	50V 0.0056	1	
R6512	ERDS2TJ331	1/4W 330			1					
R6511 R6512 R6513	ERDS2TJ331 ERDS2TJ563	1/4W 56K	1		C2021	ECEA1HKR1	Electrolytic	50V 0.1	*	
R6512 R6513 R6514		+			C2021 C2022	ECEA1HKR1 ECEA0JK470	Electrolytic Electrolytic	50V 0.1 6.3V 47	1	
R6512 R6513 R6514 R6515	ERDS2TJ563	1/4W 56K	1		1				1	
R6512 R6513 R6514	ERDS2TJ563 ERDS2TJ750	1/4W 56K 1/4W 75	1		C2022	ECEAOJK470	Electrolytic	6.3V 47	1	

	Ref. No.	Part No.	Part Name &	Description	Pcs /	Remarks	Ref. No.	Part No.	Part Name A	& Danovintian	Pcs	: D
Page	C2027	ECEAOJK470	Electrolytic	-6.3V 47			02052					IVEIDITES
Control   Cont	C2028	. i					—I — · · · · · · · · · · · · · · · ·					ļ <u>.</u>
Company   Company   Process   Proc	C2029											
COUNTY	C2030,2031						: l				1	!
Description	C2032		i		+							<u> </u>
Compose	C2033		-+									
Control	L	<del></del>		· · · · · · · · · · · · · · · · · · ·			- 11					
Column	L						<b>→</b>		_+		4	
Company	I											ļ <u></u>
Common			+						<del></del>		<del></del>	!
Company   Comp	1		- i				<b>→  </b>				1	
	L						<del></del>				1	
Company			<del></del>						Ceramic	50V 0.1	1	L
COMPANDED   Company   Co			+				<b>⊣⊢</b> +		Ceramic	50V 0.001	2	
COMPAND   COMP	L							VYC25473KX	Semiconductor	25V 0.047	2	i
COMPAND   COMP	L						C3075	ECCZ1H101K	Ceramic	50V 100P	1	
December							C3076	ECEAOJK470	Electrolytic	6.3V 47	1	
				50V 0.022	1		C3077	ECCZ1H270K	Ceramic	50V 27P	1	
EXCRAINSOID   Electrolyte   SOV   1				10V 22	1		C3078	VCY25473KX	Semiconductor	25V 0.047	2	,
COMPAND   COMP	i		Tantalum	16V 0.1	1		C3079	ECCZ1H470K	Ceramic	50V 47P	1	
COMPAN   C			Electrolytic	50V 1	1		C3080	ECKZ1H102KB	Ceramic		1	
COMPANY   Comp		ECKZ1H472ZF	Ceramic	50V 0.0047	1		C3081,3082	ECKZ1H103	Ceramic		2	
COSS   CONTAINON   Ceremic   SOV   0.01		ECWM1H153KZ	Polyester	50V 0.015	1		C4001	ECKZ1H561KB			+	
COMPAND   SECTIONIZE   Steel Steel   Section	ł +	ECKF1H103ZV	Ceramic	50V 0.01	1		C4002					
COMMISSION   Com	C2053	ECEA10Z22	Electrolytic	10V 22	1		C4003					
COSSIDER   CONTINUENCE   Corante   SOV   SOV   1	C2054	ECKZ1H680KB	Ceramic	50V 68P	1		T					
CODO-1	C2055	ECKZ1H681KB	Ceramic	50V 680P	1 ,							
December	C2057	ECKZ1H102KB	Ceramic	50V 0.001	1							
C-0002   V-CV-WIRDO-NS	C3001	ECEA1EK4R7	Electrolytic	25V 4.7	1						- 1	
	C3002	VCYW1H104JS	Ceramic		1		<b>-</b>					704
C2004   C2004X270   Electrolytic   C307   C305   C2001   C2011   C20	C3003	ECEA1HK010	Electrolytic		1							
CONTINUES   CONTINUES   Ceramic   SOV   0.01   1   CA011   SCMHINISER   Polymeter   SOV   0.015   1   CONTINUES	C3004	ECEAOJK470			1		-11					
CODE   SCENIER   Control   CODE   C	C3005				1		1					
CODIO	C3007,3008				?		75				1	···
COUNTY   C												
COUNTY   C	C3010		************				7					
SCEALINKE70											1	
CAULAN   C	C3012	ECEAOJK470	Electrolytic	6.3V 47	1		-i					
CAD14	C3013	ECEA1HK2R2	Electrolytic	50V 2.2	1							
C3015   ECEAICRS211   Electrolytic   6-39   22   1   C4020   ECSF16ER2ZK   Tantalum   16-9   0.22   1   C3016   ECEAOLX220   Electrolytic   6-39   22   1   C4021   ECGV05473LZ   Polyester   50-9   0.047   1   1   1   1   1   1   1   1   1	C3014	ECWM1H333KZ	Polyester	50V 0.033	1		- L		<del></del>			
C3016   ECEADINA220   Electrolytic   6.3V   22   1     C4021   ECQU054731Z   Polyester   50V   0.047   1   C3017   ECSALAK330   Electrolytic   10V   33   1   C4022   ECEALAK330   Electrolytic   10V   33   1   C4021   ECEALAK330   Electrolytic   10V   10   1   C4024   ECEALAK330   Electrolytic   6.3V   47   1   C4024   ECEALAK330   Electrolytic   6.3V   47   1   C4024   ECEALAK330   Electrolytic   50V   0.22   1   C4023   ECEALAK330   Electrolytic   50V   0.22   1   C4023   ECEALAK330   Electrolytic   10V   33   1   C4023   ECEALAK330   Electrolytic   10V   33   1   C4023   ECEALAK330   Electrolytic   10V   33   1   C4024   ECEALAK330   Electrolytic   10V   33   1   C4025   ECEALAK330   Electrolytic   10V   33   1   C4024   ECEALAK330   Electrolytic   10V   33   1   C4025   ECEALAK330   Electrolytic   10V   10V   1   ELECTROLYTIC   10V   22   ELECTROLYTIC   10V   22   ELECTROLYTIC   10V   22   ELECTROLYTIC   10V   22   ELECTROLYTIC   10V   23   ELECTROLYTIC	C3015	ECEA1CSS331			1		11					
Color	C3016	<del></del>					4					
C3018   ECC21H330K   Ceramic   50V   33F   1     C4023   ECEALCKJO   Electrolytic   16V   10   1	C3017						4	a series and a series and	4			
C3019   C6X2 H102NB   Ceramic   50V   0.01   1   C4024   ECEAD 4470   Electrolytic   6.3V   47   1   1   1   1   1   1   1   1   1	C3018		1									
C3020   C6CA1HKR1   Electrolytic 50V 0.1   1   C4025   ECCA1HKR22   Electrolytic 50V 0.22   1   C3021   ECKA1HK218   Ceramic 50V 220P 1   C4026   ECST16ER15K   Tantalum 16V 0.15   1   C3023,3024   ECA1HK010   Electriytic 50V 1 2   C4026   ECST16ER15K   Tantalum 16V 0.1 5   1   C3023,3024   ECA1HK010   Electrolytic 50V 1 50P 1   C4026   ECST16ER15K   Tantalum 16V 0.1 1   C3026   ECCA1HS11K   Ceramic 50V 150P 1   C4028   ECSF16ER1K   Tantalum 16V 0.1 1   C3026   ECCA1HK010   Electrolytic 25V 4.7   C4030   ECRA1KK30   Electrolytic 16V 47   L3026   ECKA1HK010   Electrolytic 50V 1.1   L3026   ECKA1HK010   Electrolytic 50V 2.2   L3026	C3019											
C3021   ECKZ1H221K8   Geramic   Sov   220P   1	C3020			and the second	- i		4	<del></del>	the comment of the comment			
C3023,3024   ECEALHK010   Electrlytic   50V   1   2   C4027   ECEALAK330   Electrolytic   10V   0.5   1   1   1   1   1   1   1   1   1	C3021		•		1				***************************************		1	
C3025   ECCZ   ECCZ   ELECT   SUN   150P   1   C4028   ECS		<u> </u>					41		i		1	
C3026   ECEALEKAR7   Electrolytic   25v   4.7   1							11				1 .	
C3027   ECEAHKNIO   Electrolytic   50V   1   1			• • •		·		Here and the second				1	
C3028   ECEAHKK282   Electrolytic   50V   2.2   1		i								16V 47	1	
C3029   ECKZIHS61KB   Ceramic   50V   56P   1   C6402   ECEAHK010   Electrolytic   50V   1   1							F		the second commence of the second		1	
C3030   ECEAOJK470   Electrolytic   6.3V   47   1     C6403   ECEAOJK010   Electrolytic   50V   1   1										16V 22	1 ;	
C3031   ECKZ1H271KB   Ceramic   50V   270P   1   C6404   ECEA1EK330   Electrolytic   50V   1   1							1		Electrolytic	50V 1	1	
C3032   ECEAUK221   Electrolytic   6.3V   220   1     C6501   ECEAHROID   Electrolytic   50V   1   1									Electrolytic	16V 33	1	
C3033,3034 ECKZ1H103ZV Ceramic 50V 0.01 2 C6502,6503 ECEALHKOLO Electrolytic 50V 1 2 C3035 FCEALCKIOO Electrolytic 16V 10 1 C6504 ECEALCKIOO Electrolytic 16V 10 1 C6504 ECEALCKIOO Electrolytic 16V 10 1 C6504 ECEALCKIOO Electrolytic 16V 10 1 C6505 ECKZ1H10ZKB Ceramic 50V 0.001 1 C3039 ECEALCKIOO Electrolytic 16V 10 1 C6506,6507 ECCZ1H12LK Ceramic 50V 0.001 1 C30304 ECVIZM60X64 Trimmer 60P 1 C6508 ECVIZM60X64 Trimmer 60P 1 C6509 ECKILEDKE CERAMIC 50V 120P 2 C3040 ECVIZM60X64 Trimmer 60P 1 C6509 ECKILEDKE CERAMIC 50V 0.01 3 C6504 ECCILEDKE CERAMIC 50V 0.01 3 C6504 ECCALCKIOO Electrolytic 16V 10 1 C6506 ECCALCKIOO ELECTROLYTIC 6.3V 47 2 C68002 ECCALCKIOO ELECTROLYTIC 50V 0.01 1 C68001 ECCALCKIOO ELECTROLYTIC 50V 0.01 1 ELECTROL			to the state of the state of		1		11:	ECEA1HK010	Electrolytic	50V 1	1	
C3035   FCEAICK100   Electrolytic   16V   10   1     C6504   ECEAICK100   Electrolytic   16V   10   1							C6501	ECEA1EK4R7	Electrolytic	25V 4.7	1	
C3036-3038 ECEAIRK010 Electrolytic 50V 1 3		<del> </del>			2		C6502,6503	ECEA1HK010	Electrolytic	50V 1	2	
C3039 RCEAICK100 Electrolytic 16V 10 1					.1		C6504	ECEA1CK100	Electrolytic	16V 10	1	
C3049   RCEAICK100   Electrolytic   16V   10   1     C6506,6507   ECCZIH12IK   Ceramic   50V   120P   2   2   2   2   2   3   3   3   3   3				50V 1	3		C6505	ECKZ1H102KB	Ceramic	50V 0.001	1	
C3042   ECVIZM60X64   Trimmer   60P   1   C6509   ECFAIEKZ20   Electrolytic   25 y   22   1					1		C6506,6507	ECCZ1H121K	Ceramic			
C3042   ECVIZM60X64   Trimmer   60P   1   C6509   ECFAIEK220   Electrolytic   25V   22   1					1		C6508	ECSF16ER27K	Tantalum	16V 0.27	1	
C3043   VCYWIR104JS   Ceramic   50V   0.1   1     C6510-6512   ECKFIR1037F   Ceramic   50V   0.01   3				60P	1		C6509	ECEA1EK220			1	
C3044   ECEA1CK100   Electrolytic   16V   10   1     C8001   ECEA1AK330   Flectrolytic   10V   33   1			Ceramic	50V 0.1	1		C6510-6512	ECKF1H103ZF			3	
C3045   SCEA0JK470   Electrolytic   6.3V   47   2     C8002   ECKZ H103ZV   Ceramic   50V   0.01   1     C8003   ECKZ H103ZV   Ceramic   50V   0.01   1   C8003   ECKZ H47ZZF   Ceramic   50V   0.047   1   C3048   ECCZ H560K   Ceramic   50V   56P   1   C8004   ECKZ H681KB   Ceramic   50V   680P   1   C3049   ECCZ H181K   Ceramic   50V   180P   1   C8005   ECCZ H080CC   Ceramic   50V   8P   1   C8005   C8005   ECCZ H080CC   Ceramic   50V   8P   1   C8005   ECCZ H080CC   CERAMIC   50V   6P   1   C8005   ECCZ H080CC   ECCZ H080			Electrolytic	16V 10	1	w= · · · · · · · · · · · · · · · · · · ·	C8001		*		1	
C3047   ECKZ1H103ZV   Ceramic   50V   0.01		ECEAOJK470	Electrolytic	6.3V 47	2		C8002				1	
C3048		ECKZIH103ZV	Ceramic	50V 0.01	1						1	
C3049 ECCZ1H181K Ceramic 50V 180P 1 C8005 ECCZ1H080CC Ceramic 50V RP 1		ECCZ1H560K	Ceramic	50V 56P	1						1	
		ECCZ1H181K	Ceramic	50V 180P	1						+	
C3050		ECKZ1H103ZV	Ceramic	50V 0.01	1						1	
C3051 FCXZ1H681KB Ceramic 50V 690P 1	3051	ECKZ1H681KB	Ceramic		1 :						1	
C3052   ECCZ H101K   Ceramic 50V 100P   C8008   ECFA H010   Electrolytic 50V   1	3052	ECCZ1H101K	Ceramic		1						1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks	Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
C8010	ECEA1CK100	Electrolytic 16V 10	1				Delay Lines		
08011	ECKZ1H472ZF	Ceramic 50V 0.0047	1		DL3001	EFDKL645A12A o	L.,		1
08012	ECEA1HK2R2	Electrolytic 50V 2.2	1			VLD0030	<u> </u>		
C8012					DI 8001	EFDKR645B85A o			
	ECEA1CK100	Electrolytic 16V 10	1		DL8001	i	-		·
C8014	ECCZ1H470K	Ceramic 50V 47P	1			VLD0029			
C8015,8016	ECEA1AK330	Electrolytic 10V 33	2						
C8017	ECEA1HK010	Electrolytic 50V 1	1						
C8018	VCYW1H104JS	Ceramic 50V 0.1	1						
C8019,8020	ECEA1CK100	Electrolytic 16V 10	2				Pin Headers	İ	
C8021	ECEA1HK010	Electrolytic 50V 1	1		Pl	VJPS0033	2 P	1	
C8022	ECCZ1H820K	Ceramic 50V 82P	1		P2	VJPS0043	12P	1	
ACCUPANT OF			-		P3	VJPS0037	6P	1	
	+				P4,5	VJPS0041	10P	2	
		· · · · · · · · · · · · · · · · · · ·			P6	VJPS0036	5P	1	
	<del></del>	Coils			P7-10	VJPS0039	8P	4	
L1001-1003	VLQ0085	00110	3		Pll	VJPS0033	2P		
		••••			P12	VJPS0034	3P	1	
L1004-1006	VLQ0084		3		l <del></del>				
L1007	VLQ0083	<del>-</del>	1	!	P13	VJPS0041	10P	1	
L2001	VLQEL05R101K	100μΗ	1	· · · · · · · · · · · · · · · · · · ·	P14	VJP1141	2P	- 1	
L2002	VLQEL05R220K	22µH	. 1	· ·	P15	VJPS0039	8P	-1-	
L2003,2004	VLQEL05R3R9K	3.9µH	2		P16,17	VJPS0033	2P	2	
L3001-3003	VLQEL05R101K	100µH	3		P19	VJPS0037	6P	1	
L3004	VLQEL05R180K	184н	1		P20	VJPS0036	5P	1	
L3005	VLQEL05R3R9K	3.9µH	1						
L3006	VLQEL05R101K	100µн	1			1			
L3007	VLQEL05R270K	27µH	1						
L3008	VLQS66F102K	1mH	1						
L3009	VLQEL05R470K	470µH	1						
L3010	VLQELO5R100K				l	· · · · · · · · · · · · · · · · · · ·	Crystal Oscillators		
		10µH	1		V2001		Ciystal Oscillators		
L3011	VLQEL05R101K	100µH			X2001	VSX0086			
L3012	VLQS66F471K	470µH	1		X8001	VSX0085		1	
L3014-3017	VLQEL05R101K	100µн	4						
13019,3020	VLQELO5R3R9K	3.9µн	2						
L4001	VLQFL06L222J	2.2mH	1	· · · · · · · · · · · · · · · · · · ·					
L4002	VLQS66F101K	100µН	1						
L4003	VLQ0093		1				Fuse		
L4004	VLQFL06L682J	6.8mH	1		F1001	XBA1C05NU100	0.5A	1	
L6501	VLQEL05R101K	100µH	1		F6501	XBA1C25NU100	2.5A	1	
L8001	VLQEL05R680K	68µH	1						
L8002	VLQEL05R470K	47µH	1						
L8003	VLQEL05R390K	394н	1						
L8004	VLQFL06R682J	6.8mH	1				Relay		
L8005	VLQEL05R330K	33µн	1	*	RY6401	VSYS0006		ı	
L8006	VLQEL05R101K	100µH	1		RY6501	AG29001		1	
18007	VLQS66F221K	220uH	1		II			+	
		-			l			+	
					<del>-</del> -	· <del></del>			
					<del> </del>	· <del>!</del>	Transformer		
		<del> </del>			T4001	P1M702078	Transformer		
		<del></del>			14001	ELM7Q207E	Detector	1	
					<del> </del>				
		Filters				<del></del>			
FL3001	VLF0135		1						
FL3002	VLF0168		1		<b> </b>		Miscellaneous		
FL3003,3004	VLF0167		2			TJC6320	Fuse Holder	4	
FL3005	VLF0136	4	1			VEJS0011	Jack	1	
FL8001	VLF0159		1			VKC0052	Hinge A	2	
FL8002	VLF0158		1			VKC0053	Hinge B	2 .	
						VMZS0059	Head Amp Insulator Sheet	1	
					lt et	. VMZS0060	Power Insulator Sheet	1	
<del>-</del>	-					VSCS0129	Head Amp Shield Case		
	- +						processors and a construction of the construct	1	
	+	-			<del>-</del>	VSCS0130	Head Amp Shield Case	1 :	
	_i					VSCS0131	Head Amp Shield Case	1	
						VSCS0132	Power Shield Case	1 ;	
		<u> </u>				VSCS0133	Power Shield Case	1	
						VSCS0134	Power Shield Case	1	
								1	
		T						1	
	1								
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Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks	Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		System Control & Memory			R6033,6034	ERDS2TJ562	1/4W 5.6K	2	
		Counter C.B.A.			R6037-6039	ERDS2TG1003	I/4W 100K	3	
					R6040	ERDS2TG2003	1/4W 200K	1	-
			!		R6041	ERDS2TJ123	1/4W 12K	1	
	<u> </u>	Integrated Circuits			R6042	ERDS2TJ222	1/4W 2.2K	1	
IC6001	µPD7502G−063		1		R6043-6045	ERDS2TJ223	1/4W 22K	1	
IC6002	MN1455AVA	ļ	1		R6046	ERDS2TJ563	1/4W 56K	1	
IC6003	MN1455AVB		1		R6047	ERDS2TJ153	1/4W 15K	1	
IC6004,6005	μPD4503BC		2		R6048	ERDS2TJ103	1/4W 10K	1	
IC6006	μ <b>PC393C</b>		1		R6050	ERDS2TJ223	1/4W 22K	1	
					R6051,6052	ERDS2TJ103	1/4W 10K	2	
					R6053	ERDS2TJ105	1/4W 1M	1	
		Transistors		*****	R6054	ERDS2TJ104	1/4W 100K	1	
26001-6008	2SB641(Q,R,S)		8		R6055	ERDS2TJ332	1/4W 33K	1	
26009	2SD636(Q,R,S)	7/14	1		R6056	ERDS2TJ271		<del></del>	
26010	2SD637(Q,R,S)		1	were the second	R6057	ERDS2TJ223		1	
26011	2SD636(Q,R,S)		1				1/4W 22K	1	
6012		• • • • • • • • • • • • • • • • • • • •	-	***	R6058	ERDS2TJ823	1/4W 82K	1	
06013,6014	2SD637(Q,R,S)		1		R6059	ERDS2TJ223	1/4W 22K	1	
	2SB641(Q,R,S)		2		R6060	ERDS2TJ124	1/4W 120K	1	
6015,6016	2SD636(Q,R,S)		2		R6061	ERDS2TJ223	1/4W 22K	1	
16017	2SB641(Q,R,S)	·	1		R6062	ERDS2TJ823	1/4W 82K	1	
6018	2SD636(Q,R,S)		1		R6063	ERDS2TJ223	1/4W 22K	1	
(6019	2SD992		1		R6064	ERDS2TJ682	1/4W 6.8K	1	
(6020-6022	2SD636(Q,R,S)		3		R6065	ERDS2TJ563	1/4W 56K	1	
06023	2SB641(Q,R,S)		1		R6066,6067	ERDS2TJ103	1/4W 10K	2	
06024	2SC2594		1	-	R6068	ERDS2TJ221	1/4W 220	1	
6025,6026	2SD636(Q,R,S)		2		R6069	ERDS2TJ103	1/4W 10K	1	
6027	2SB641(Q,R,S)		1		R6070-6072	ERDS2TJ104			
6028	2SD636(Q,R,S)		1		R6073		1/4W 100K	3	
6029	2SB641(Q,R,S)		1			ERDS2TJ224	1/4W 220K	1	
6030	2SD638(Q,R,S)				R6074	ERDS2TJ104	1/4W 100K	1	
			1		R6075,6076	ERDS2TJ103	1/4W 10K	2	
6031-6035	2SB641(Q,R,S)		5		R6077,6078	ERDS2TJ563	1/4W 56K	2	
6036,6037	2SD636(Q,R,S)		2		R6079	ERDS2TJ103	1/4W 10K	1	
6039,6040	2SD636(Q,R,S)		2		R6080	ERDS2TJ333	1/4W 33K	1	
16041	2SD637(Q,R,S)		1		R6081	ERDS2TJ561	1/4w 560	1	
		Diodes			R6082,6083	ERDS2TJ563	1/4W 56K	2	
6001-6007	LN28CA1	L.E.D.	7		R6084	ERDS2TJ103	1/4W 10K	1	
6008	MA27WA		1		R6085	ERDS2TJ333	1/4W 33K	1	V. L
6009-6022	MA165		14		R6086	ERDS2TJ560	1/4W 56	1	
6023	EM1Z		1		R6087	ERDS2TJ273	1/4W 27K	1	
6024-6030	MA165		7		R6088	EVN3ACA00B14	Variable 10K	1	
6031	LN28CAL	L.E.D.	1		R6089	ERDS2TJ563	1/4W 56K	1	
6033-6038	MA165		6		R6090	ERDS2TJ223	1/4W 22K	1	
	-				R6091	ERDS2TG2202	1/4W 22K	1	
	i	· · · · · · · · · · · · · · · · · · ·			R6092	ERDS2TG1003	1/4W 100K	1	3-1-10H
	+				R6093	ERDS2TG1803	1/4W 180K	1	
					R6094	ERDS2TG4703		1	
					- · · · · · · · · · · · · · · · · · · ·		1/4W 470K	1	· · · · · · · · · · · · · · · · · · ·
—— <u> </u>		Pagistars			R6095	ERDS2TJ564	1/4W 560K	1	
5001	PDDC2T7563	Resistors			R6096	ERDS2TJ223	1/4W 22K	1	
5002-6005	ERDS2TJ561	1/4W 560	1		R6097	ERDS2TJ334	1/4W 330K	1	
	ERDS2TJ223	1/4W` 22K;	4		R6098	ERDS2TJ123	1/4W 12K	1	
6006	ERDS2TJ821	1/4W 820	1		R6099	ERDS2TJ104	1/4W 100K	1	
6007,6008	ERDS2TJ223	1/4W 22K	2		R6100	ERDS2TJ103	1/4W 10K	1	
009	ERDS2TJ103	1/4W 10K	1		R6101	ERDS2TJ223	1/4W 22K	1	
010,6011	ERDS2TJ223	1/4W 22K	2		R6102	ERDS2TJ473	1/4W 47K	1 .	
012	ERDS2TJ561	1/4W 560	1		R6103	ERDS2TJ103	1/4W 10K	1	
013	ERDS2TJ223	1/4W 22K	1		R6104	ERDS2TJ223	1/4W 22K	1	
014	ERDS2TJ561	I/4W 560	1		R6105	ERDS2TJ473	1/4W 22K	1	
015	ERDS2TJ223	1/4W 22K	1		R6106,6107	ERDS2TJ104			
016,6017	ERDS2TJ563	1/4W 56K	2		R6108		1/4W 100K	2	
018	ERDS2TJ223	1/4W 22K	1		11	ERDS2TJ472	1/4W 4.7K	1	
019					R6109	ERDS2TJ222	1/4W 2.2K	1	
020	ERDS2TJ473	1/4W 47K	1		R6110	ERDS2TJ103	1/4W 10K	1	
	ERDS2TJ223	1/4W 22K	1		R6111	ERDS2TJ222	1/4W 2.2K	1	
022	ERDS2TJ331	1/4W 330	1		R6112-6115	ERDS2TJ223	1/4W 22K	4	
023-6025	ERDS2TJ563	1/4W 56K	3		R6116	ERDS2TJ103	1/4W 10K	1	
026	ERDS2TJ123	1/4W 12K	1		R6119-6124	ERDS2TJ223	1/4W 22K	6	
027-6029	ERDS2TJ104	1/4W 100K	3		R6125	ERDS2TJ103	1/4W 10K	1	
	ERDS2TJ153	1/4W 15K	1		R6126	ERDS2TJ104	1/4W 100K		
030							2, 7H 100K		
030	ERDS2TJ561	1/4W 560	1		R6127	ERDS2TJ102	1/4W 1K	1 -	

Ref. No.		Part No.	Part Name & Description	Pcs / Set	Remarks	Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
R6129,6130		ERDS2TJ104	1/4W 100K	2				Capstan Motor Drive C.B.A.		
R6131		ERDS2TJ562	1/4W 5.6K	1						
R6132		ERDS2TJ104	1/4W 100K	1						
R6133		ERDS2TJ223	1/4W 22K	1				Integrated Circuits		
R6134,6135		ERDS2TJ563	1/4W 56K	2		IC2601	VEFSS001		1	
R6136		ERDS2TJ103	1/4W 10K	1		IC2602	AN6676		1	
R6137,6138		ERDS2TJ223	1/4W 22K	2						
R6139,6140	I.	ERDS2TJ563	1/4W 56K	2						
R6143		ERDS2TJ332	1/4W 3.3K	1				Transistors		
R6144-6148		ERDS2TJ151	1/4W 150	5		Q2601-2603	2SB819(P,Q)		3	
R6149		ERDS2TJ682	1/4W 6.8K	1						
R6150		ERDS2TJ270	1/4W 27	1						
	L							Resistors		
	$\perp$					R2601	ERX12ANJR56	Metal Oxide 1/2W 0.56	1	
	_					R2602	ERDS2TJ392	1/4W 3.9K	1	
						R2603-2605	ERDS2TJ270	1/4W 27	3	
	1									
			Capacitors							
C6001		ECEA1HKL010	Eelctrolytic 50V 1	1				Capacitors		
C6002,6003		ECKF1H221KB	Ceramic 50V 220P	2		C2601	ECEA1HKR1	Electrolytic 50V 0.1	1	<del></del> -
C6004-6006		ECKF1H102KB	Ceramic 50V 0.001	3		C2602	ECEA1CK330	Electrolytic 16V 33	1	
C6007		ECKF1H103ZV	Ceramic 50V 0.01	1		C2603	ECEA1CK470	Electrolytic 16V 47	1	
C6008		ECEA1HK010	Electrolytic 50V 1	1		C2604-2606	ECEA1HK010	Electrolytic 50V 1	3	
C6009-6011		ECKF1H103ZV	Ceramic 50V 0.01	3						
C6012,6013		ECKF1H561KB	Ceramic 50V 560P	2			1			
C6014		ECKF1H103ZV	Ceramic 50V 0.01	1				Pin Header		
C6015		ECEAOJK470	Electrolytic 6.3V 47	1		P31	VJPS0041	10P:	1	
C6016		ECEA1HK010	Electrolytic 50V 1	1						
C6018		ECKF1H102KB	Celamic 50V 0.001	1				:		
C6021	T	ECKF1H472ZF	Ceramic 50V 0.0047	1			-			
C6023		ECEAOJK220	Electrolytic 6.3V 22	1						
C6024		ECEA1EK4R7	Electrolytic 25V 4.7	1						
								1		
	T .									
										- 1- mask 6-
			Pin Headers					Miscellaneous		
P21-24	1	VJPS0050	8P	4			VJBS00191	Flexible Wires	1	
P25	1	VJPS0035	4P	1			VMXS0091	Drive Spacer	1	
P26		VJPS0034	3P	1			VWJS0001	Flex Strip Jumper	1	
P27		VJPS0041	10P	1					-	
P28	T	VJPS0036	5P	1						
P29		VJPS0037	6P	1						
P30	_	VJPS0041	10P	1			<del> </del>			
	1									
	$\vdash$	-				<del>                                     </del>			-	
	1	-				<del> </del>				
			Switches						+	
SW6001-6011	$\Box$	EVQ-QS107K	Push Switch	11		<u> </u>			+	
SW6012	$^{\dagger}$	ESD14185	Select Switch	1		<u> </u>			-+	
SW6013	T	ESD14184	Camera Remote Switch	1			<b>†</b>		+	
SW6014	Н	EMR-2512	Power Switch	1		-			-+	
		·							+	
	$\vdash$		Miscellaneous			<del> </del>			-	
		KL02	Spacer	8			<del> </del> -	+		
	$\vdash$	VEKS0803	Riquid Crystal Display	1		<del>                                     </del>	+			
	$\vdash$		Counter Ass'y	-		<del></del>	+		-	
	1-1	VJBS00175	Riquid Crystal Display	1					-	
		-50000113	Counter P.C.B.						-	
				1		<b> </b>	+		_	
	-	VMDS0072		1		<u> </u>				
	-	VMDS0072	Counter Holder						- 1	
		VMXS0070	Counter Spacer	1						
		VMXS0070 VSQS0129	Counter Spacer Conductive Rubber	1						
		VMXS0070	Counter Spacer Conductive Rubber Riquid Crystal Display	1						
		VMXS0070 VSQS0129	Counter Spacer Conductive Rubber	1						
		VMXS0070 VSQS0129	Counter Spacer Conductive Rubber Riquid Crystal Display	1						
		VMXS0070 VSQS0129	Counter Spacer Conductive Rubber Riquid Crystal Display	1						
		VMXS0070 VSQS0129	Counter Spacer Conductive Rubber Riquid Crystal Display	1						
		VMXS0070 VSQS0129	Counter Spacer Conductive Rubber Riquid Crystal Display	1						
		VMXS0070 VSQS0129	Counter Spacer Conductive Rubber Riquid Crystal Display	1						

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks Ref. No.		Part No.	Part Name & Description	Pcs / Set	Remarks
	ļ	Cylinder Motor Drive					Full Erase Head C.B.A.		
		C.B.A.							
		Integrated Circuit		0/552	100	0(0((n o n)	Transistor		
C2501	AN6387	Integrated Circuit	1	Q4553	251	D636(P,Q,R)		1	
	-		_						
							Resistor	-	
		Transistors		R4553	ERI	DS2TJ333	1/4W 33K	1	
2023-2025	2SD636(Q,R,S)		3				7,111 331	-	
					+ -		Capacitors		
		Diodes		C4551	EC	EA1CK100	Electrolytic 15V 10	1	
02006-2008	MA165		3	C4555	EC	WM1H153KZ	Polyester 50V 0.015	1	
02501	MA165		1	C4556	ECI	KF1H472ZFV	Ceramic 50V 0.0047	1	
	-			C4557	EC	WM1H333KZ	Polyseter 50V 0.033	1	
		Resistors							
2088	ERDS2TJ105	1/4W 1M	1				Pin Header		
2089	ERDS2TJ104	1/4W 100K	1	P48	VJ	PS0033	2P	1	
2090,2091	ERDS2TJ223	1/4W 22K	2						
12092	ERDS2TJ103	1/4W 10K	1						
12094	ERDS2TJ184	1/4W 180K	1		+		Transformer		
2094	EVN3ACA00B15 ERDS2TJ104	Variable 100K	1	T4551	ELI	47Q011E	Detector	1	
12096	ERDS2TJ104 ERDS2TJ153	1/4W 100K 1/4W 15K	1			_			
2501	ERDS2TJ124	1/4W 13K	1		-				
2502	ERX12ANJR56	Metal Oxide 1/2W 0.56	1						
2503	ERDS2TJ104	1/4W 100K	1		-				
2504	ERDS2TG3902	1/4W 100K	1		++-				
2505	ERDS2TG1502	1/4W 15K	1		+				
2506-2508	ERDS2TJ470	1/4W 47	3		++-				
	-							-	
					1	-		-	
		Capacitors			T		Sub System Control C.B.A.		
2049	ECKZ1H102ZF	Ceramic 50V 0.001	1					-	
2050	ECSF16ER15K	Tanalum 16V 0.15	1						
2501	ECEA1CK470	Electrolytic 16V 47	1				Integrated Ciruit		
2502 2503	ECWM1H123KZ	Polyester 50V 0.012	1	1C6554	μPD	4528BC		1	
2504	ECKF1H472FV	Ceramic 50V 0.0047	1						
2505	ECWM1H682KZ ECEA1EK3R3	Polyester 50V 0.0068 Electrolytic 25V 3.3	1						
2506	ECSF16ER22K		1		44		Transistor		
2507	ECKZ1H102KB	Tantalum 16V 0.22 Ceramic 50V 0.001	1	Q6553	2 SD	636(Q,R)		1	
2508	ECEA1CK470	Electrolytic 16V 47	1						
2509-2511	ECEA1HN2R2	Electrolytic 50V 2.2	3		-				
		307 2.2	-	D6553,655	MATI		Diodes		
				100333,033	MA1	0.0		2	
					-				
		Miscellaneous			++-	-	Resistors		
	VMXS0031	Spring	3	R6552	ERX		Metal Oxide 1/2W 3.9	ì	<del></del>
				R6555		S2TJ105	1/4W 1M	1	
				R6556		S2TJ224	1/4W 220K	1	
				R6557,6558	<del></del>	52TJ104	1/4W 100K	2	
				R6559		32TJ334	1/4W 330K	1	
				R6560		S2TJ104	1/4W 100K	1	
	ii			R6561	ERDS	32TJ224	1/4W 220K	1	
	<u> </u>						Capacitors		
			+	C6551			Electrolytic 16V 6800	1	
			+	C6552-6554			Gold Capacitor 1.8V 1	3	
			-	C6555			Tantalum 16V 10	1	
			$\dot{-}$	C6556	ECSE	16V1K	Tantalum 16V 1	1	
			+						
					1				
	i	1	- 1	11					
			$\pm$		1				

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Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks	Ref. No.	Part No.	Part Name & Description	/ Set	Remarks
<del></del>		Pin Headers			1		Takeup Reel Detector		
P34-37	VJPS0033	2P	4		+		C.B.A.		
P38	VJPS0035	4P	1				0.5.7.	_	
P49	VJPS0036	5P		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	1				
P49	V3F80036	31	1		-		Integrated Circuits		
					701553 1553	ON2160	Integrated Circuits	2	
<u> </u>					IC1552,1553	UN2100			-
					<b></b>				
					l		D. T. 1		
		· · · · · · · · · · · · · · · · · · ·			1	H TROOPIC	Pin Header	<b>-</b> ,	
				ļ	P42	VJPS0046	4P	1	
							1		
1									<u> </u>
							Miscellaneous		
						VJBS00173	Takeup Reel Detector	1	
							P.C.B.		
						VMXS0081	Sensor Spacer	2	
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					1	1		<u> </u>	
<u> </u>	**	<del></del>	-		-	<u> </u>			
		Constant Part Batantan	-	·	<del> </del>		Takeup Photo TR C.B.A.		
h		Supply Reel Detector					Takeup Photo Ik C.B.A.		
		C.B.A.	i		-				
<u> </u>					0.551	DV1 50171	Transistor	l .	_
					Q1551	PN150NV	!	1	
IC1551		Integrated Circuit							
101551	ON2160		1		<b></b>			i	
ļ					1-10	-110000	Pin Header		
<u>:</u>					P40	VJPS0033		1	
		Pin Header			<u> </u>		-		
P39	VJPS0035	4P	1			_			
<b></b>	- 4				1		Miscellaneous	<u> </u>	<u> </u>
	- ∔					VJBS00169	Takeup Photo TR P.C.B.	1	
ļ		Miscellaneous			1				
1									
	VJBS00174	Supply Reel Detector	1		ļ				
		Supply Reel Detector P.C.B.		A A / / A / / A					
	VJBS00174 VMXS0081	Supply Reel Detector P.C.B. Sensor Spacer	1						
		Supply Reel Detector P.C.B. Sensor Spacer							
		Supply Reel Detector P.C.B. Sensor Spacer	1						
		Supply Reel Detector P.C.B. Sensor Spacer	1						
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		Supply Reel Detector P.C.B. Sensor Spacer	1						
		Supply Reel Detector P.C.B. Sensor Spacer	1						

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
	-	Supply Photo TR C.B.A.	_	
		<del>                                     </del>	-	
	<del></del>	Transistor	<u> </u>	
Q1552	PN150NV	Photo Transistor	1	
	11130117	11000 1101013001	-	
		Pin Header	ļ	
P41	VJPS0034	3P	1	
	10100034	31	-	
		+		
	<del></del>	Miscellaneous		
	VJBS00170	Supply Photo TR P.C.B.	1	
		dopping there in items.	_	
		+		
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		Sefer Tel C to 1 C D		
		Safety Tab Switch C.B.A.		
-		<u> </u>		
		Pin Header		
P50	VJPS0033		-	
		2P	1	
-	<u> </u>			
- +	-	Switch		
SW1555	VSH0017	Safety Tab Switch	1	
	1000017	barety lab Switch		
	1			
		Miscellaneous		
	VJBS00206	Safety Tab Switch P.C.B		
	VMZS0066	Insulator Sheet	1	
-	VII230000	THEOTALDI SHEEL	1	
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	T			
		ELECTRICAL PARTS LOCATED		
		ON CHASSIS		***
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			-+	
	VSCS0165	Converter Shield Case	7	
	VSCS0165 VSCS0166	Converter Shield Case	1	
		Converter Shield Case	1	
	VSCS0166	Converter Shield Case RF Converter	1	
	VSCS0166 ENC16501	Converter Shield Case RF Converter Check Terminal	1 1 3	
	VSCS0166 ENC16501 TJE98102	Converter Shield Case RF Converter Check Terminal Dew Sensor Ass'y	1 1 3 1	
	VSCS0166 ENC16501 TJE98102 VEKS0775	Converter Shield Case RF Converter Check Terminal Dew Sensor Ass'y Camera Jack Ass'y	1 1 3 1	
	VSCS0166 ENC16501 TJE98102 VEKS0775 VEKS0801	Converter Shield Case RF Converter Check Terminal Dew Sensor Ass'y Camera Jack Ass'y Multi Pull Jack Ass'y	1 1 3 1 1	
	VSCS0166 ENC16501 TJE98102 VEKS0775 VEKS0801 VEKS0802	Converter Shield Case RF Converter Check Terminal Dew Sensor Ass'y Camera Jack Ass'y Multi Pull Jack Ass'y F.G Head P.C.B.	1 1 3 1 1 1	
	VSCS0166 ENC16501 TJE98102 VEKS0775 VEKS0801 VEKS0802 VJBS00172	Converter Shield Case RF Converter Check Terminal Dew Sensor Ass'y Camera Jack Ass'y Multi Pull Jack Ass'y F.G Head P.C.B. Check Terminal	1 3 1 1 1 1 31	
	VSCS0166 ENC16501 TJE98102 VEKS0775 VEKS0801 VEKS0802 VJBS00172 VJES0003 VJES0003	Converter Shield Case RF Converter Check Terminal Dew Sensor Ass'y Camera Jack Ass'y Multi Pull Jack Ass'y F.G Head P.C.B. Check Terminal Check Terminal	1 1 3 1 1 1 1 31 31	
1.553	VSCS0166 ENC16501 TJE98102 VEKS0775 VEKS0801 VEKS0802 VJBS00172 VJES0003 VJES0003 XTV26+6J	Converter Shield Case RF Converter Check Terminal Dew Sensor Ass'y Camera Jack Ass'y Multi Pull Jack Ass'y F.G Head P.C.B. Check Terminal Check Terminal Tapping Screw, 2.6x6	1 1 3 1 1 1 1 31 31 3	
	VSCS0166 ENC16501 TJE98102 VEKS0775 VEKS0801 VEKS0802 VJBS00172 VJES0003 VJES0003 XTV26+6J	Converter Shield Case RF Converter Check Terminal Dew Sensor Ass'y Camera Jack Ass'y Multi Pull Jack Ass'y F.G Head P.C.B. Check Terminal Check Terminal Tapping Screw, 2.6x6 Diode Zener	1 3 1 1 1 1 3 1 3 2 1 1	
1553 1501 1553	VSCS0166 ENC16501 TJE98102 VEKS0775 VEKS0801 VEKS0802 VJBS00172 VJES0003 VJES0003 XTV26+6J ERZ-C03DK220 VJSS0031	Converter Shield Case RF Converter Check Terminal Dew Sensor Ass'y Camera Jack Ass'y Multi Pull Jack Ass'y F.G Head P.C.B. Check Terminal Check Terminal Tapping Screw, 2.6x6 Diode Zener 5P Jack	1 1 3 1 1 1 1 31 3 2 1	
501	VSCS0166 ENC16501 TJE98102 VEKS0775 VEKS0801 VEKS0802 VJBS00172 VJES0003 VJES0003 XTV26+6J ERZ-C03DK220 VJSS0031	Converter Shield Case RF Converter Check Terminal Dew Sensor Ass'y Camera Jack Ass'y Multi Pull Jack Ass'y F.G Head P.C.B. Check Terminal Check Terminal Tapping Screw, 2.6x6 Diode Zener	1 3 1 1 1 1 3 1 3 2 1 1	
1501	VSCS0166 ENC16501 TJE98102 VEKS0775 VEKS0801 VEKS0802 VJBS00172 VJES0003 VJES0003 XTV26+6J ERZ-C03DK220 VJSS0031	Converter Shield Case RF Converter Check Terminal Dew Sensor Ass'y Camera Jack Ass'y Multi Pull Jack Ass'y F.G Head P.C.B. Check Terminal Check Terminal Tapping Screw, 2.6x6 Diode Zener 5P Jack Resistor Variable 200K	1 1 3 1 1 1 1 31 3 2 1	
.553	VSCS0166 ENC16501 TJE98102 VEKS0775 VEKS0801 VEKS0802 VJBS00172 VJES0003 VJES0003 KTV26+6J ERZ-C03DK220 VJSS0031 EVLEHAT12B25	Converter Shield Case RF Converter Check Terminal Dew Sensor Ass'y Camera Jack Ass'y Multi Pull Jack Ass'y F.G Head P.C.B. Check Terminal Tapping Screw, 2.6x6 Diode Zener 5P Jack Resistor Variable 200K Slow Tracking	1 1 3 1 1 1 1 1 31 3 2 1 1	
.553	VSCS0166 ENC16501 TJE98102 VEKS0775 VEKS0801 VEKS0802 VJBS00172 VJES0003 VJES0003 KTV26+6J ERZ-C03DK220 VJSS0031 EVLEHAT12B25	Converter Shield Case RF Converter Check Terminal Dew Sensor Ass'y Camera Jack Ass'y Multi Pull Jack Ass'y F.G Head P.C.B. Check Terminal Tapping Screw, 2.6x6 Diode Zener 5P Jack Resistor Variable 200K Slow Tracking	1 1 3 1 1 1 1 1 31 3 2 1 1	
.553	VSCS0166 ENC16501 TJE98102 VEKS0775 VEKS0801 VEKS0802 VJBS00172 VJES0003 VJES0003 KTV26+6J ERZ-C03DK220 VJSS0031 EVLEHAT12B25	Converter Shield Case RF Converter Check Terminal Dew Sensor Ass'y Camera Jack Ass'y Multi Pull Jack Ass'y F.G Head P.C.B. Check Terminal Tapping Screw, 2.6x6 Diode Zener 5P Jack Resistor Variable 200K Slow Tracking	1 1 3 1 1 1 1 1 31 3 2 1 1	
1501	VSCS0166 ENC16501 TJE98102 VEKS0775 VEKS0801 VEKS0802 VJBS00172 VJES0003 VJES0003 KTV26+6J ERZ-C03DK220 VJSS0031 EVLEHAT12B25	Converter Shield Case RF Converter Check Terminal Dew Sensor Ass'y Camera Jack Ass'y Multi Pull Jack Ass'y F.G Head P.C.B. Check Terminal Tapping Screw, 2.6x6 Diode Zener 5P Jack Resistor Variable 200K Slow Tracking	1 1 3 1 1 1 1 1 31 3 2 1 1	
1501	VSCS0166 ENC16501 TJE98102 VEKS0775 VEKS0801 VEKS0802 VJBS00172 VJES0003 VJES0003 KTV26+6J ERZ-C03DK220 VJSS0031 EVLEHAT12B25	Converter Shield Case RF Converter Check Terminal Dew Sensor Ass'y Camera Jack Ass'y Multi Pull Jack Ass'y F.G Head P.C.B. Check Terminal Tapping Screw, 2.6x6 Diode Zener 5P Jack Resistor Variable 200K Slow Tracking	1 1 3 1 1 1 1 1 31 3 2 1 1	
1501	VSCS0166 ENC16501 TJE98102 VEKS0775 VEKS0801 VEKS0802 VJBS00172 VJES0003 VJES0003 KTV26+6J ERZ-C03DK220 VJSS0031 EVLEHAT12B25	Converter Shield Case RF Converter Check Terminal Dew Sensor Ass'y Camera Jack Ass'y Multi Pull Jack Ass'y F.G Head P.C.B. Check Terminal Tapping Screw, 2.6x6 Diode Zener 5P Jack Resistor Variable 200K Slow Tracking	1 1 3 1 1 1 1 1 31 3 2 1 1	
1501	VSCS0166 ENC16501 TJE98102 VEKS0775 VEKS0801 VEKS0802 VJBS00172 VJES0003 VJES0003 KTV26+6J ERZ-C03DK220 VJSS0031 EVLEHAT12B25	Converter Shield Case RF Converter Check Terminal Dew Sensor Ass'y Camera Jack Ass'y Multi Pull Jack Ass'y F.G Head P.C.B. Check Terminal Tapping Screw, 2.6x6 Diode Zener 5P Jack Resistor Variable 200K Slow Tracking	1 1 3 1 1 1 1 1 31 3 2 1 1	
1501	VSCS0166 ENC16501 TJE98102 VEKS0775 VEKS0801 VEKS0802 VJBS00172 VJES0003 VJES0003 KTV26+6J ERZ-C03DK220 VJSS0031 EVLEHAT12B25	Converter Shield Case RF Converter Check Terminal Dew Sensor Ass'y Camera Jack Ass'y Multi Pull Jack Ass'y F.G Head P.C.B. Check Terminal Tapping Screw, 2.6x6 Diode Zener 5P Jack Resistor Variable 200K Slow Tracking	1 1 3 1 1 1 1 1 31 3 2 1 1	
1501	VSCS0166 ENC16501 TJE98102 VEKS0775 VEKS0801 VEKS0802 VJBS00172 VJES0003 VJES0003 KTV26+6J ERZ-C03DK220 VJSS0031 EVLEHAT12B25	Converter Shield Case RF Converter Check Terminal Dew Sensor Ass'y Camera Jack Ass'y Multi Pull Jack Ass'y F.G Head P.C.B. Check Terminal Tapping Screw, 2.6x6 Diode Zener 5P Jack Resistor Variable 200K Slow Tracking	1 1 3 1 1 1 1 1 31 3 2 1 1	
1501	VSCS0166 ENC16501 TJE98102 VEKS0775 VEKS0801 VEKS0802 VJBS00172 VJES0003 VJES0003 KTV26+6J ERZ-C03DK220 VJSS0031 EVLEHAT12B25	Converter Shield Case RF Converter Check Terminal Dew Sensor Ass'y Camera Jack Ass'y Multi Pull Jack Ass'y F.G Head P.C.B. Check Terminal Tapping Screw, 2.6x6 Diode Zener 5P Jack Resistor Variable 200K Slow Tracking	1 1 3 1 1 1 1 1 31 3 2 1 1	
1501	VSCS0166 ENC16501 TJE98102 VEKS0775 VEKS0801 VEKS0802 VJBS00172 VJES0003 VJES0003 KTV26+6J ERZ-C03DK220 VJSS0031 EVLEHAT12B25	Converter Shield Case RF Converter Check Terminal Dew Sensor Ass'y Camera Jack Ass'y Multi Pull Jack Ass'y F.G Head P.C.B. Check Terminal Tapping Screw, 2.6x6 Diode Zener 5P Jack Resistor Variable 200K Slow Tracking	1 1 3 1 1 1 1 1 31 3 2 1 1	
1501	VSCS0166 ENC16501 TJE98102 VEKS0775 VEKS0801 VEKS0802 VJBS00172 VJES0003 VJES0003 KTV26+6J ERZ-C03DK220 VJSS0031 EVLEHAT12B25	Converter Shield Case RF Converter Check Terminal Dew Sensor Ass'y Camera Jack Ass'y Multi Pull Jack Ass'y F.G Head P.C.B. Check Terminal Tapping Screw, 2.6x6 Diode Zener 5P Jack Resistor Variable 200K Slow Tracking	1 1 3 1 1 1 1 1 31 3 2 1 1	
.553	VSCS0166 ENC16501 TJE98102 VEKS0775 VEKS0801 VEKS0802 VJBS00172 VJES0003 VJES0003 KTV26+6J ERZ-C03DK220 VJSS0031 EVLEHAT12B25	Converter Shield Case RF Converter Check Terminal Dew Sensor Ass'y Camera Jack Ass'y Multi Pull Jack Ass'y F.G Head P.C.B. Check Terminal Tapping Screw, 2.6x6 Diode Zener 5P Jack Resistor Variable 200K Slow Tracking	1 1 3 1 1 1 1 1 31 3 2 1 1	

Ref. No.	Part No.	Part Name &	Descripti	Pcs / Set	Remarks	
		Transmitter C	.B.A.			
	-					
		Integrated Ci	rcuit			
IC1	MN1453AWR				1	
		<del> </del>				
		Diode				
D16	0A90G				1	
R13	ERD25TJ681	Resistors	1/4W	680	1	
VR1	EVNB4A00B53	Variable		5K	1	
		C				
C1	ECEA1CK470	Capacitors	16V	47	1	
C2	ECEA1HK2R2	Electrolytic	50V	2.2	1	
C3	ECCF1H390JU	Ceramic	50V	39P	1	
C4	ECKF1H221KB	Ceramic	50V	220	1	-
				_		
	<del>-</del>	Miscellaneous				
	MU16VPB3-A	Transmitter P.	С.В.		1	
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	<del>-</del>	-				
				-	-	- 11
		-				
	1					